February, 1956

COAL MINING

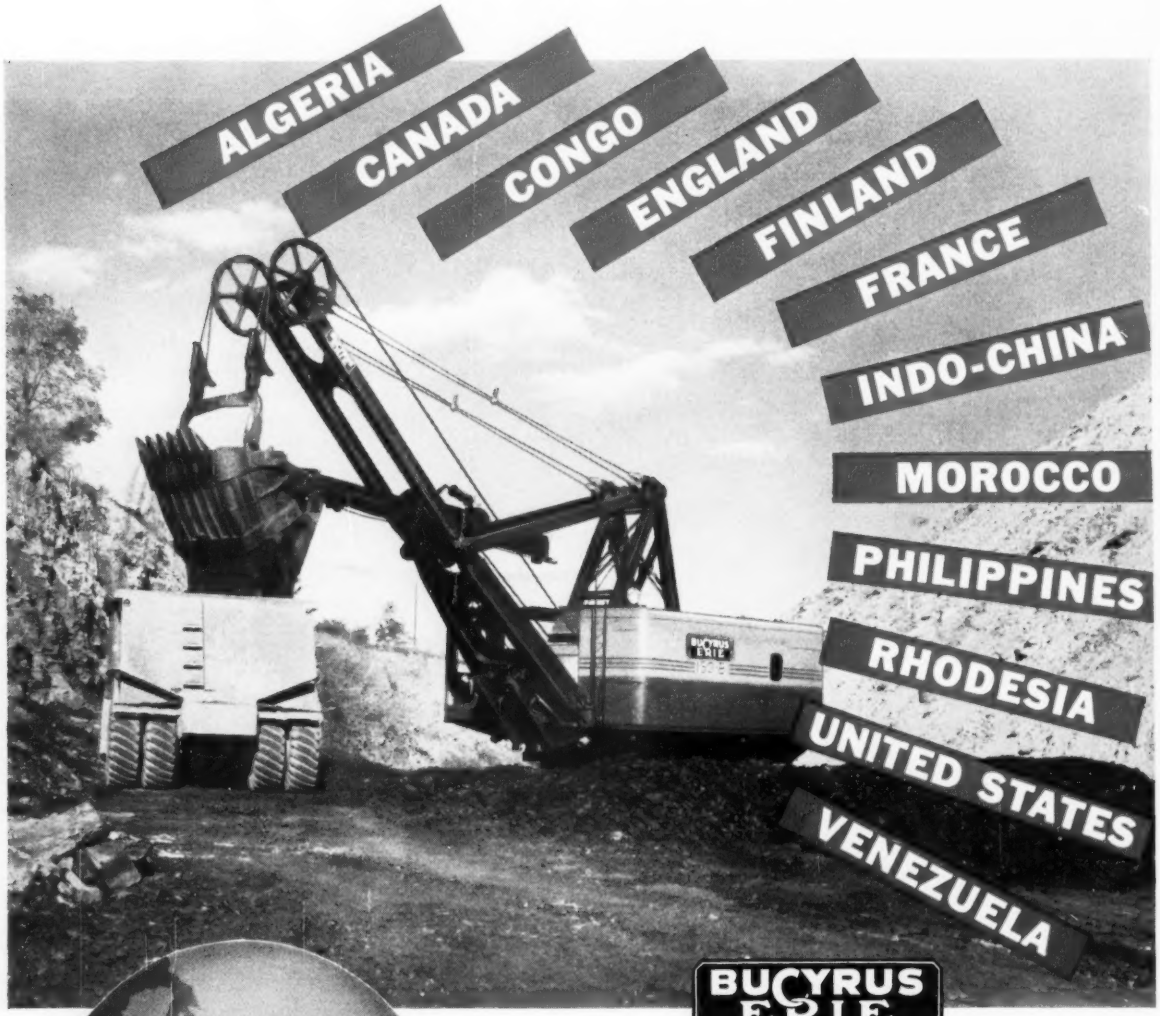
Volume 33, No. 2

● Dozing hard sandstone in stripping and building access roads keeps 2 Allis-Chalmers HD-21s busy at the Peerless Mine of *Coal River Mining Co.*, Hookersville, W. Va. (subsidiary of *Tasa Coal Co.*) The HD-21s work 16 hours a day, 7 days a week. They move up to 1,500 yards of material in each 8-hour shift.

Highway EQUIPMENT COMPANY
6465 Hamilton Ave.
Pittsburgh 6, Pa.

4
UNIVERSITY MICROFILMS
313 N 1st ST.
ANN ARBOR, MICH.

GLOBAL APPROVAL



110-B 4½ cu. yds.
150-B ..6-cu. yds.
190-B ..8-cu. yds.

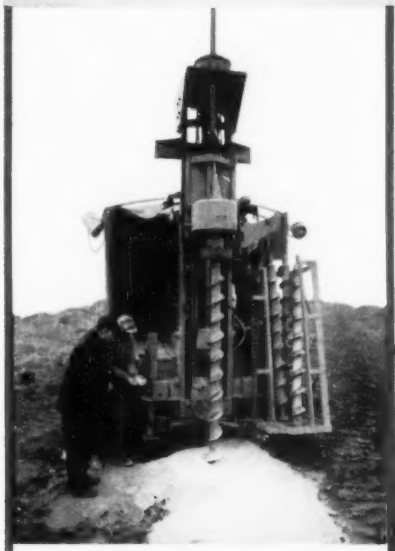
Scores of these outstanding excavators have proven their worth in varied quarrying, mining, and heavy-duty construction projects all over the world.

Remember, FOR THAT EXTRA MARGIN — in design, in construction, in all round performance, and, above all, in output — it's BUCYRUS-ERIE Ward Leonard electric excavators. 44L55C

BUCYRUS-ERIE COMPANY

South Milwaukee, Wisconsin

CUT MINING COSTS
WITH HEAVY – RUGGED – POWERFUL
McCarthy AUGER DRILLS



VERTICAL
MODEL 106-24

World's Fastest Heavy-Duty Vertical Auger Drill

Bores faster, deeper, larger dia. holes than any other auger drill. New gear reduction unit slows auger rotation for operation in hard rock formations. Drills 8" and 9" dia. holes readily in shale and sandstone formations, drills larger dia. holes up to 24" dia. in softer formations.

Write for Bulletin M-100

FINGER-TIP CONTROL

Gives Desired Rotating Speed Of Auger

HYDRAULIC FEED

Provides Any Speed Up To 6 Feet Per Minute Horizontal Feed Of Drill

COAL RECOVERY

"Walks" from hole to hole to auger high-quality Bonus Coal

An Ohio miner removes 300 tons of coal in each 6 1/2-hour working day with this Model 14 36-42 x 12' McCarthy drill, operated by two men. He drills 42" dia. holes 144' deep. Auxiliary conveyor eliminates spillage at hole. It operates on either side of drill for working blind cut. Twelve different models of McCarthy Coal Recovery Drills mine low-cost "bonus coal."

Write for Bulletin M-101 and M-102

HORIZONTAL
MODEL 104

Lowest Drilling Costs per foot, Self-Propelled or Truck-Mounted

Bores up to 12" dia. holes to 150' depth faster, cheaper than any other horizontal drill. Requires less working space, saves many man-hours. . . operates easily in tight, hard-to-reach locations.

Write for Bulletin M-105

THE SALEM TOOL COMPANY

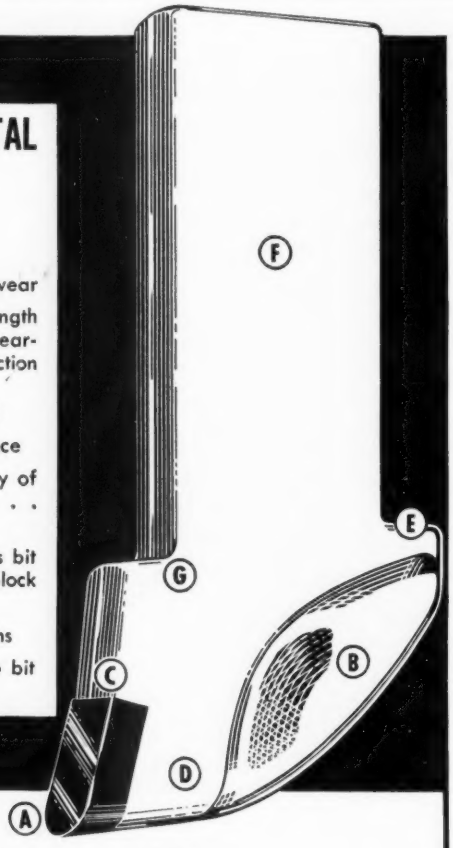
SOUTH ELLSWORTH AVENUE
SALEM, OHIO, U. S. A.

SALEM

Printed monthly by Basset Press & Mailing Company, Published by Modern Mining Publishing Co., Executive Publisher P. F. JASIK, 4575 Country Club Drive, Pittsburgh, Pa. Price: in the United States, $2.00; all other countries $5.00. Single copy 50 cents. SECOND CLASS mail privileges authorized at Pittsburgh, Pennsylvania.

New improved KENNAMETAL cutter bit design offers many features

- **A** Hard carbide tip for longer cutting wear
- **B** "I-Beam" construction adds strength while providing greater cutting clearance, especially for circular action cutters
  Thinner web . . . less steel to grind
- **C** Ideal top angle for cutting clearance
- **D** Good carbide support, with plenty of steel to back-up carbide tip . . . prevents breakage
- **E** Self-gaging shoulder . . . prevents bit from being forced back into the block and damaging chain
- **F** Shank styles to fit all popular chains
- **G** Knock-out shoulder . . . speeds up bit changes when needed



KENNAMETAL'S new cutter bit design provides:

- greater cutting efficiency at higher loads and speeds
- longer bit service
- fewer bit changes
- fast bit changes when required
- lower power consumption
- less machine downtime
- less machine maintenance
- lower percentage of extreme fines
- thus, higher production and reduced cost per ton of coal

All KENNAMETAL* Cutter Bits now of new, improved design . . . *rugged "I-Beam" construction*

Always a leader in cutter bit improvements that help bring out more coal faster, Kennametal has redesigned the complete line of Kennametal cutter bits. These improved cutter bits have now been in use in the mines for several months, undergoing most severe tests under almost every conceivable cutting condition . . . medium, hard and tough. They have been used in just about every cutting duty . . . on Joy, Jeffrey, Goodman, Compton, McCarthy Rotary and other machines. Results indicate the new design fills the need for even greater coal production capacity with fewer interruptions for bit sharpening or replacement. Thus, cost per ton of coal is reduced.

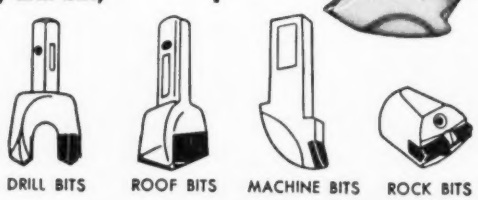
Have you tried these improved Kennametal Cutter Bits in your operations? If you have not, ask your Kennametal representative to show you these bits. Then test them in your mine. KENNAMETAL INC., Mining Tool Division, Bedford, Pennsylvania.

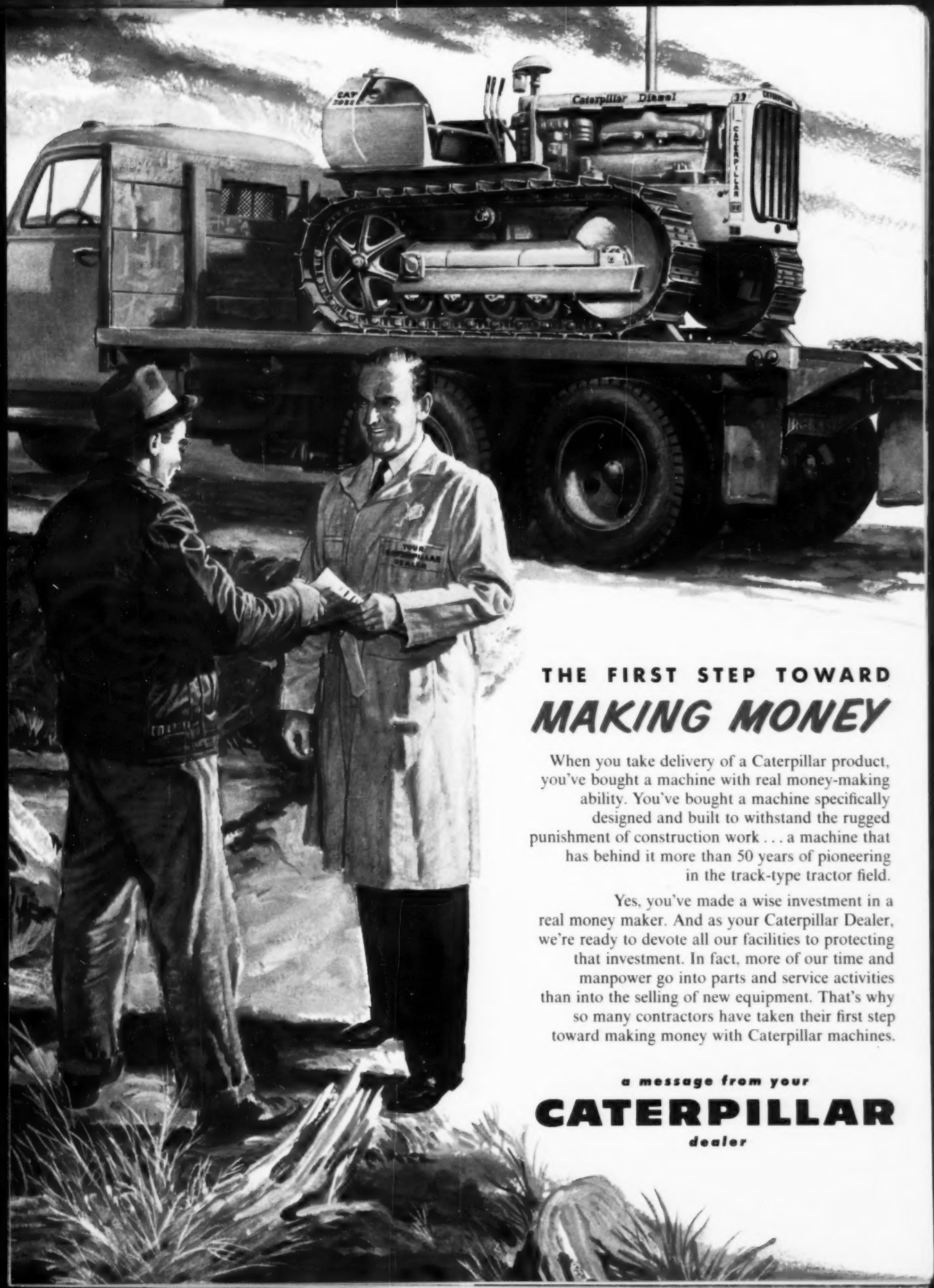
* Registered Trademark

There is a KENNAMETAL cutter bit for every cutting condition

Ask about complete line of KENNAMETAL cutter bits, drill bits, roof bits, augers, pinning rods, accessories 9413

INDUSTRY AND
KENNAMETAL
. . . Partners in Progress





THE FIRST STEP TOWARD

MAKING MONEY

When you take delivery of a Caterpillar product, you've bought a machine with real money-making ability. You've bought a machine specifically designed and built to withstand the rugged punishment of construction work . . . a machine that has behind it more than 50 years of pioneering in the track-type tractor field.

Yes, you've made a wise investment in a real money maker. And as your Caterpillar Dealer, we're ready to devote all our facilities to protecting that investment. In fact, more of our time and manpower go into parts and service activities than into the selling of new equipment. That's why so many contractors have taken their first step toward making money with Caterpillar machines.

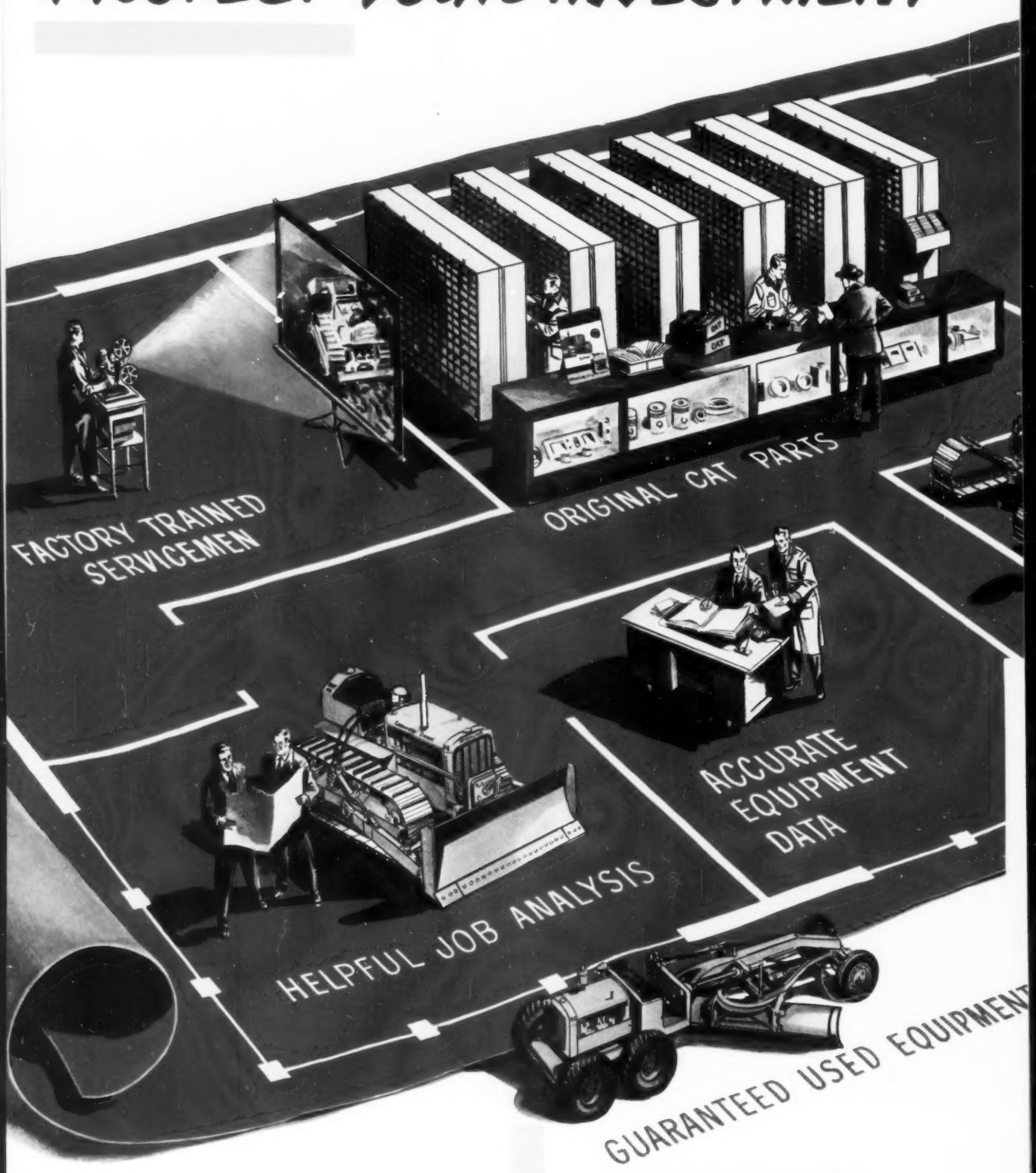
a message from your

CATERPILLAR

dealer

HERE ARE A FEW OF THE WAYS WE

PROTECT YOUR INVESTMENT

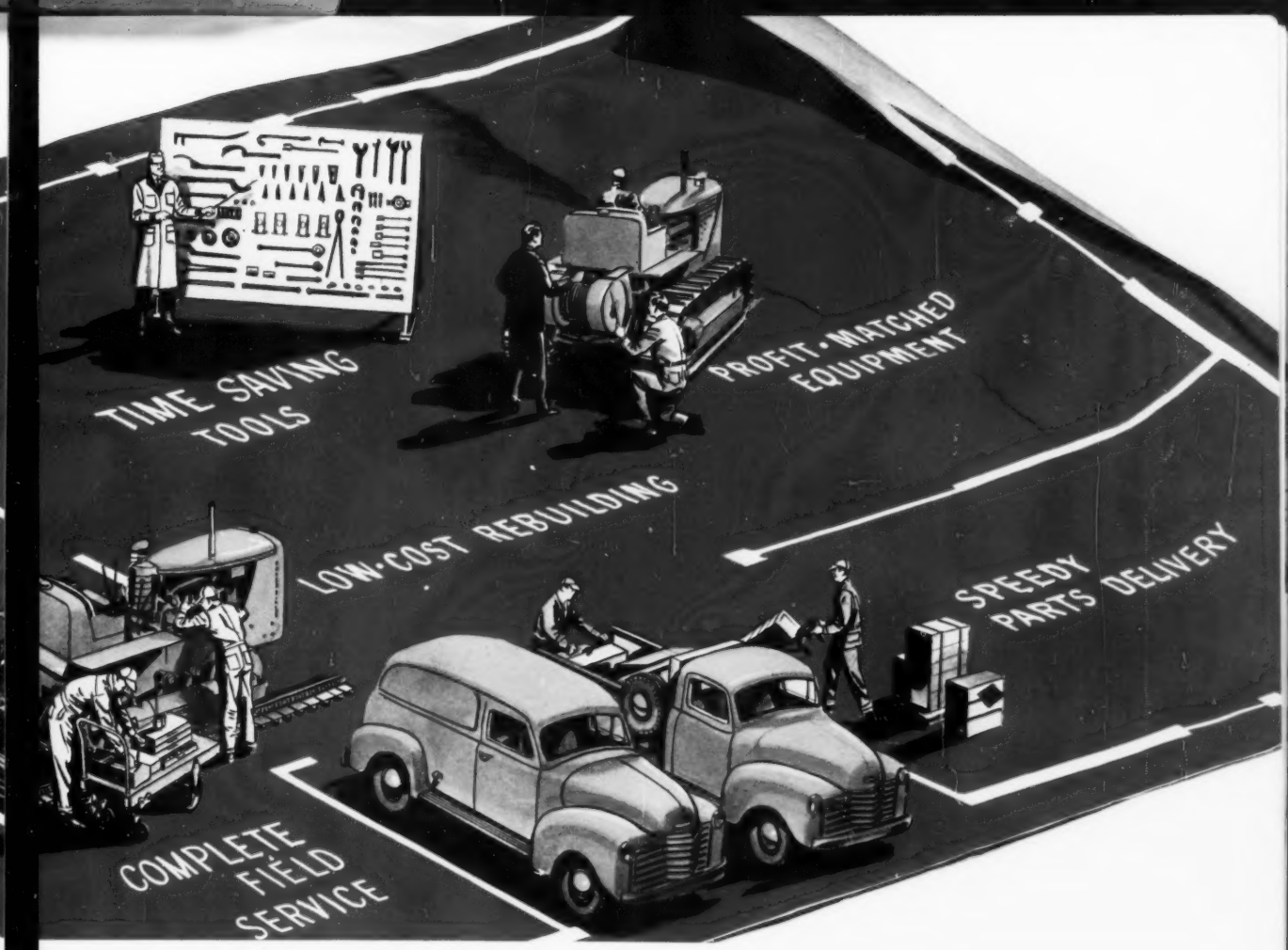


YOUR

CATERPILLAR

DEALER...

- ✔ **sells the world's most complete line...**
- ✔ **offers original Cat parts...**
- ✔ **gives you factory recommended service**



YOU CAN COUNT ON THESE SERVICES AS A CAT MACHINE OWNER

ORIGINAL CAT PARTS. Your Caterpillar Dealer is the only source for original Cat parts. Large parts stocks assure you of getting the part you need—when you need it.

LOW-COST REBUILDING. Our servicemen are trained to determine whether certain parts of your equipment can be rebuilt or must be replaced. If rebuilding is the answer, we have the finest, most modern welding equipment and machine tools to do the job at a great saving to you.

FACTORY-TRAINED SERVICEMEN. Our factory-trained men are capable of instructing your operators and mechanics in the most efficient operation and care of equipment. This training, with movies, discussions, and pamphlets is just one step in our overall job of helping make your equipment pay off.

TIME-SAVING TOOLS. Disassembly and rebuilding of your Cat equipment is done efficiently with special tools designed by Caterpillar—used only by Caterpillar Dealers. Pullers, wrenches, adapters and presses not only assure quick work at lowest cost, but protect vital parts every step of the way.

MATCHED EQUIPMENT. We offer you the most complete line of matched equipment and attachments for your Caterpillar machines. Winches, dozers, wagons, trailers, land clearing tools and grid rollers are but a few of the large selection of tools available.

SPEEDY PARTS DELIVERY. When your job is going full blast and you need an original Cat part right now, we'll see that you get the part in a short time. Just call us, tell us the serial number of your machine and the part needed . . . we'll do the rest.

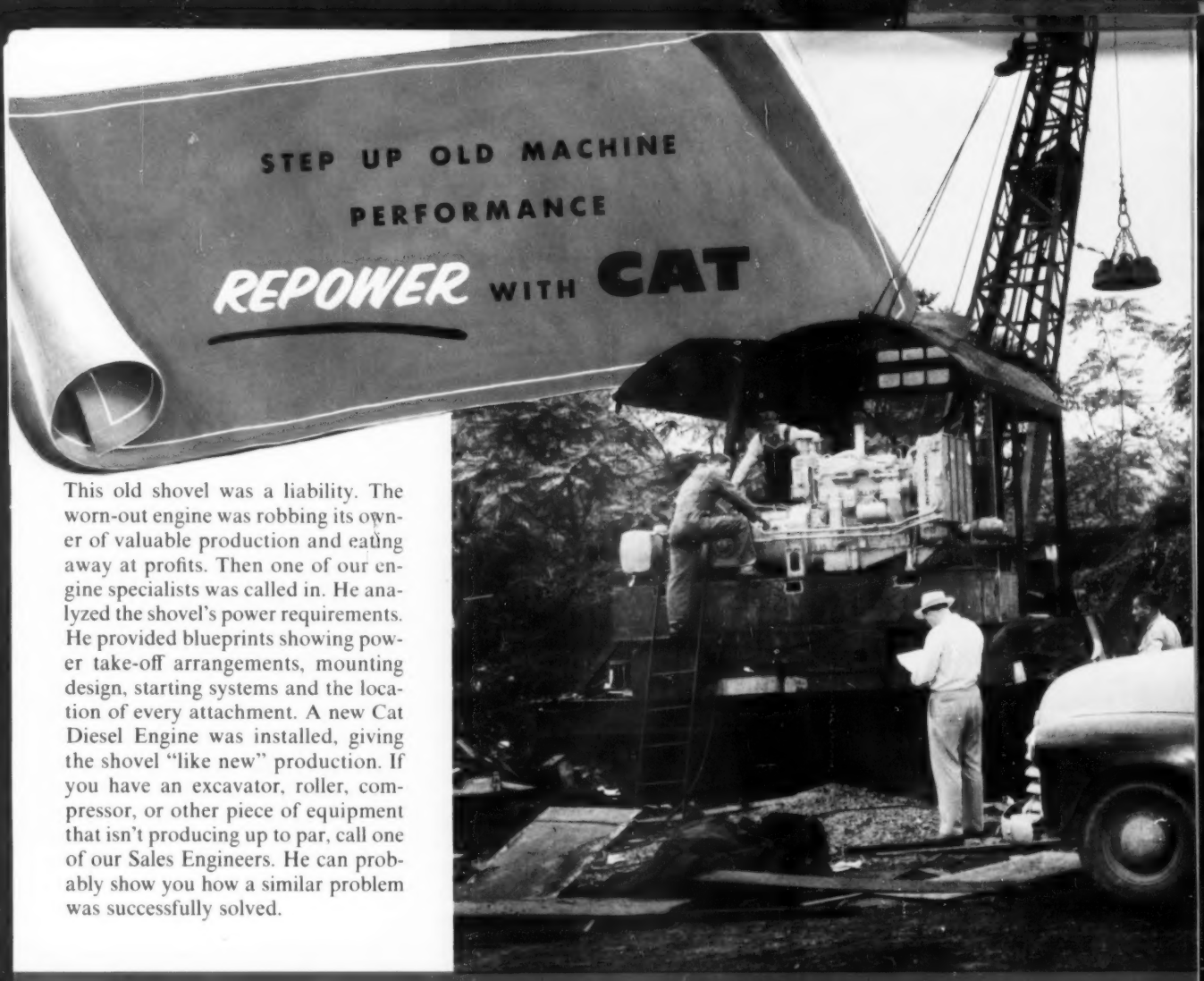
COMPLETE FIELD SERVICE. Our field service trucks are completely equipped with all the tools needed for field repairs. The servicemen are specially schooled for on-the-job work, to save you valuable production hours.

ACCURATE EQUIPMENT DATA. Our sales, parts and service men are specially trained to answer your problems and are constantly supplied with up-to-the-minute information on equipment, production and costs to help you get the most from your machines.

HELPFUL JOB ANALYSIS. Our Sales Engineers *know* heavy equipment. They are well qualified to counsel with you in selecting machines to match your job requirements.

GUARANTEED USED EQUIPMENT. Your Caterpillar Dealer stands behind the used machines he sells.

LOOK TO THE DEALER BEHIND THE PRODUCT



This old shovel was a liability. The worn-out engine was robbing its owner of valuable production and eating away at profits. Then one of our engine specialists was called in. He analyzed the shovel's power requirements. He provided blueprints showing power take-off arrangements, mounting design, starting systems and the location of every attachment. A new Cat Diesel Engine was installed, giving the shovel "like new" production. If you have an excavator, roller, compressor, or other piece of equipment that isn't producing up to par, call one of our Sales Engineers. He can probably show you how a similar problem was successfully solved.

BECKWITH MACHINERY COMPANY

6550 HAMILTON AVENUE, PITTSBURGH, PA. • OLD TOWN ROAD, CLEARFIELD, PA. • EAST BROADWAY, FARRELL, PA.
361-369 CONGRESS ST., BRADFORD, PA. • 1356 E. 12TH ST., ERIE, PA. • BUCKHANNON PIKE, CLARKSBURG, W. VA.

OHIO MACHINERY CO.

6606 SCHAAF ROAD, CLEVELAND, OHIO • 930 KINNEAR ROAD, COLUMBUS, OHIO • 2807 REYNOLDS ROAD, TOLEDO, OHIO
U. S. ROUTE 250, CADIZ, OHIO • 4000 LAKE PARK ROAD, YOUNGSTOWN, OHIO

WALKER MACHINERY CO.

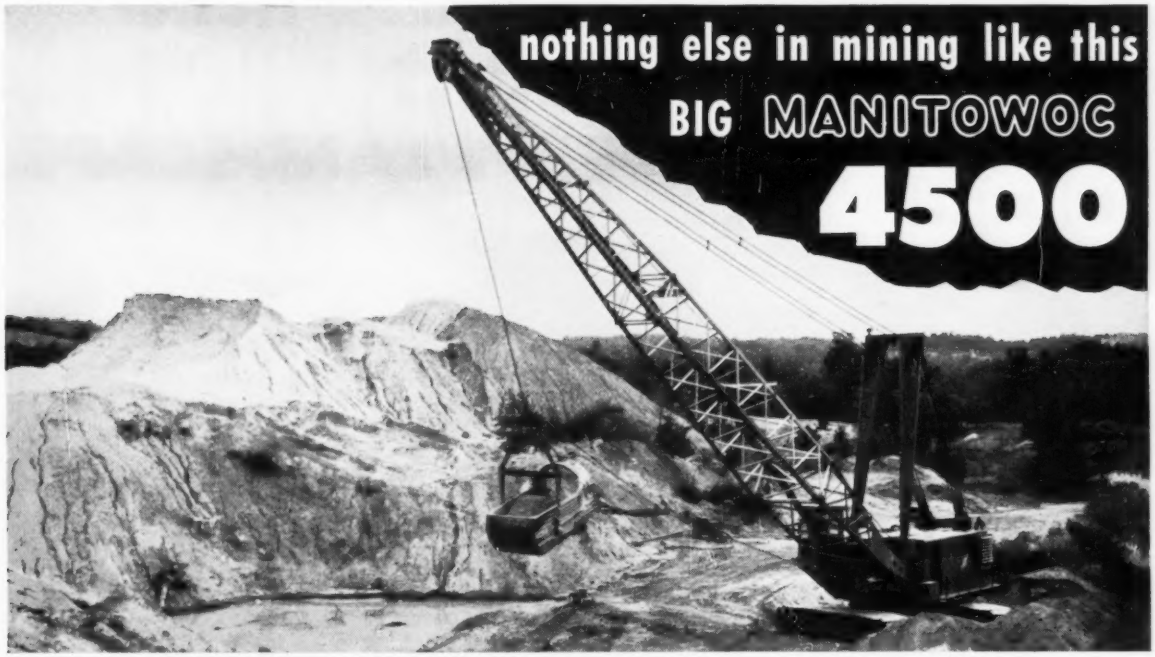
1545 HANSFORD STREET, CHARLESTON, W. VA. • 4010 EMERSON AVE., ROUTE #2 PARKERSBURG, W. VA.

CM-5

Your investment pays more when it's backed by your CATERPILLAR DEALER

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co., U.S.A.

P256A



Little downtime with great capacity is the record set by this 4500 dragline mining limonite ore for U. S. Pipe and Foundry Company near Russellville, Ala.

There's no place for undersized, underpowered mining machines when you're aiming for more production per man hour. That's why the husky Manitowoc 4500 is today's "greater output" champ among mining operators.

United States Pipe and Foundry Company of Birmingham, Ala., use two 4500 draglines equipped with 140′ booms and 4 yd. buckets for mining limonite ore. Satisfactory performance from three Manitowoc 2-yd. shovels led to their choice of the larger 4500 machines. Top capacity with little downtime for all five units, is due to Manitowoc's simple design and superior construction.

TOP DESIGN FEATURES MAKE A TRUE MINING MACHINE

GREATER SIMPLICITY OF DESIGN directs more power to the dipper or bucket. Only four main shafts — only 15 gears — only working gears turn.

GAS OR DIESEL UNIT DRIVE effectively utilizes power — eliminates thousands of electrical wires and components. Full power can be applied to any operating function with less dead weight than is found in electric machines. Greater mobility — no restrictive electrical cables.

EXCEPTIONAL STABILITY assures top capacity. Massive carbody, adequate counterweight and long, wide crawlers let you reach way out with full safety and low ground bearing pressures.

SPECIAL HI-LIFT SHOVEL BOOMS available in two lengths — 60′ boom with 45′ tubular stick and 50′ boom with 37′ stick.

POWER-SMOOTH TORQUE CONVERTER, pioneered in power shovel application by Manitowoc, multiplies engine torque three times. Efficiency is increased and engine life extended. With engine power balanced to the load, engine **cannot stall — cannot be overloaded.** Make the Manitowoc 4500 your next mining machine. Send today for your **free** copy of the new 20 page Model 4500 illustrated catalog — no obligation!

Air-operated controls and clear, unobstructed view from large comfortable cab help 4500 operator do a better job.

MANITOWOC ENGINEERING CORP.
Manitowoc, Wis.

This Allis-Chalmers Crawler Tractor MAKES A TIDY PROFIT THEN LEAVES A TIDY LANDSCAPE

The marked trend toward land reclamation is placing more and more importance on the crawler tractor. For only the crawler tractor is flexible enough to pay its way through all stages of open pit operation.

Here, the Allis-Chalmers HD-16 proves to be a real efficiency expert as it demonstrates its usefulness both during *and after* an area has been worked.

Before production begins, the HD-16 strips and stockpiles overburden. If distance from pit to stockpile is too great for dozer operation, this versatile crawler teams up with a pull-type scraper for this initial job.

After the area has been worked out, the reclamation job begins. Overburden and waste, which have been stockpiled by the busy dozer, are now pushed into the pit and leveled off quickly. Reclaimed area can then be seeded for pasture, subdivided, or developed into some other form of usable land.

During mining operations, the HD-16 is always busy. It builds and maintains haul roads, feeds hoppers and conveyors, maintains stockpiles, skids heavy equipment, handles drainage problems, is ready and able wherever a push or pull is needed.

CONSTRUCTION MACHINERY DIVISION,
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS HD-16

your choice of two outstanding drives

	Horsepower	Weight
Torque Converter Drive	150 net engine	31,600 lb
Standard Transmission Drive	131 belt	31,500 lb

plus new, longer truck frames, long-life track, straddle-mounted final drive, easier servicing . . . many other outstanding features.

Write for literature or get the full story from your Allis-Chalmers dealer.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

COAL MINING

Vol. XXXIII February, 1956 No. 2

Contents

Do You Know 10

Here and There in the Coal Industry 10

The Importance of Preventive Medicine 11

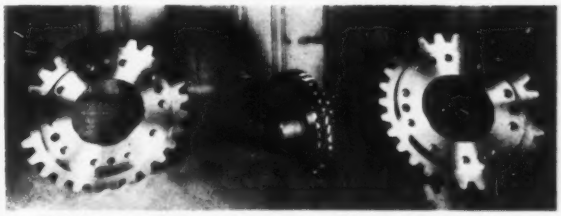
Roof Bolting With a Colmol 12

Reclamation of Stripped Land In Ohio and Pennsylvania 14

A. I. M. E. Annual Meeting 19

Keep the Machinery Rolling 21

Your New Equipment Department 24



Helical and Worm Gears for Joy 14BU Loaders
BRONZE, HELICAL and WORM GEARS
unconditionally guaranteed

Licking View Tool & Machine Co.
CAMDEN ROAD ZANESVILLE, OHIO
Distributed by
LEE SUPPLY CO. Charleroi, Pa.
OHIO VALLEY MINE SUPPLY CO. Huntington, W. Va.

HAZLETON
TYPE "PE"
U.S.B.M. APPROVED PORTABLE PUMP
70 G. P. M. 20 Ft. T. D. H.
¾ H. P. 230 Volt D. C.
Overall Length, 30" & 50"

HAROLD C. LUSK CO.
3045 W. Liberty Ave., Pittsburgh 16, Pa. LOcust 1-4191
5210 Kentucky St. So. Charleston 6, W. Va. POpular 8-6258

Published by
Modern Mining Publishing Co.
Editorial Offices
4575 Country Club Drive
Pittsburgh, Pa.
Phone TU. 1-9411
P. F. JASIK,
Publisher and Editor
Philadelphia Representative
PAUL S. KEISER
1729 Ridgeway Road
Havertown, Pa.
Hilltop 7-1090

Printed by
BASSET PRESS
AND MAILING COMPANY
377 McKEE PLACE
PITTSBURGH 13, PA.

MOVERS OF COAL STRIPPING AND CONTRACTOR'S EQUIPMENT

HEAVY HAULING -:- RIGGING

MOORE-FLESHER HAULING CO.
MOVERS of Coal Stripping and Contractor's Equipment
Preble & Adams Sts., North Side, Pittsburgh 33, Pa.
Phone ALlegheny 1-3600

SALEM "HERCULES" AUGERS FOR ELECTRIC DRILLS
Made To Withstand High Drilling Speed, Whip And Torsional Strain Of Electric Drills

Drills holes faster – Will not snap off shank or chip points – Outlasts four or five ordinary augers.

THE SALEM TOOL COMPANY SALEM, OHIO, U.S.A.

Do You Know?

• The greatest shortages in civilization's future will be in mineral resources, Dr. Vannevar Bush warned in his final annual report as president of the Carnegie Institution of Washington.

"We can see the end of the process of just digging metals out of the ground wherever we find a surface indication that they may be present," he reported.

Dr. Bush, war-time director of the U.S. research effort, retires Jan. 1 after 17 years as head of America's oldest far-flung research foundation. He is being succeeded by Dr. Caryl P. Haskins.

Man is "headed for catastrophe unless he mends his ways and takes thought for the morrow," Dr. Bush said. "This is quite apart from the immediate question whether he will use the split atom or a trained virus to turn civilization back and force it to begin again its slow upward climb, and apart from the question whether great wars can be avoided through a general understanding of their consequences."

Dr. Bush explained that these momentous questions are immediate ones, and even if resolved, man would still be headed for trouble.

"The world's population is increasing at a rate which renders distress, famine, and disintegration inevitable unless we learn to hold our numbers within reason," Dr. Bush said. "New methods of extending the food supply, powerful though they may be, can only postpone the crisis, and perhaps allow time for communication and education to produce the general understanding that is essential to a sound solution of the underlying problem.

"There is no doubt that we can go far in providing new means of sustenance for great masses of people. The cultivation of that enormous reservoir, the sea, can yield richly if we learn to control organisms and species; and our land is far from exhausted if we learn to use it well.

"The process production of foods is just beginning. An understanding of photosynthesis and the creation of its synthetic equivalent could unlock stores of vital materials beyond our present power to envisage. Our control and training of natural species and the creation of new species at will for explicit purposes, especially species of lower organisms, hold enormous possibilities. And all this depends on our progress in understanding life itself, which is the subject of fundamental biology."

We shall soon know enough photochemistry to make it possible to exploit the sun's energy, Dr. Bush predicted. He sees great ponds of chemicals gathering energy for us. Chemical engineers will convert the chemicals into convenient forms for use.

More geological knowledge on a firmer scientific basis will help in the search for metallic ores in the earth's crust. Eventually, he suggests, we may learn to train organisms to recover metals for us from the sea, as seems to have been done in times past.

Such applications are not the sole aims of science, in Dr. Bush's opinion.

"The scientist lives by faith quite as much as the man of deep religious convictions," Dr. Bush said. "He operates on faith because he can operate in no other way. His dependence on the principle of causality is an act of faith in a principle unproved and unprovable. Yet he builds on it his reasoning in regard to nature."

Here and There in the Coal Industry

JOHN J. FORBES
Director Bureau of Mines

● John J. Forbes, Director of the Bureau of Mines, retired after 40 years of Federal service, was honored by Secretary of the Interior Douglas McKay and employees of the Department at a ceremony in the Secretary's Office in Washington, D. C.

Director Forbes reached the mandatory retirement age on November 21.

When Forbes began his Federal service in 1915, the Bureau of Mines had been in existence only five years. It was operating on a budget of $758,000 and had about 400 employees. The Bureau now has about 4,000 employees and the current year's budget is $28,563,000.

Before joining the Bureau of Mines as first-aid miner in 1915, Forbes served various capacities in a number of coal mines in Pennsylvania and Ohio. Serving the Bureau successively as foreman miner, junior mining engineer, mining engineer, senior mining engineer, and principal mining engineer, Forbes in July 1927, was appointed supervising engineer of the Safety Division and was stationed at Pittsburgh, Pa., then the main field office for that division.

JESSE F. CORE

● Appointment of Jesse F. Core as general superintendent of the Frick District mines of U. S. Steel's Coal Division, with headquarters in Uniontown, Pa., was announced today by James C. Gray, vice president in charge of coal operations. He succeeds William R. Stedman who has been made staff assistant to the vice president.

At the same time, Mr. Gray announced the appointment of August R. Werft to succeed Mr. Core as chief engineer for the Frick District mines.

A native of Ford City, Pa., Mr. Core was graduated from Penn State University with a degree in mining engineering. Before coming to U. S. Steel he worked for four leading coal companies and is well known in the coal mining field. Starting in 1935 with Hillman Coal and Coke he worked first as a miner. In 1938 he joined Pittsburgh Consolidation Coal Company, being employed in various capacities until 1947 when he became chief engineer at Nemacolin Mine for the Buckeye Coal Company. He then served in the same capacity for Island Creek Coal Company at Holden, West Virginia from 1950 to 1951 when he came to U. S. Steel's Frick District as mining engineer. He was made chief engineer for the district in 1954.

THE IMPORTANCE OF PREVENTIVE MEDICINE

Selected, highly skilled personnel is bringing about a need for preventive medicine and health maintenance in industry. Machine parts, even entire machines can readily be replaced, but training and years of experience of the personnel represent a big financial investment by the employer and a worker's ability to produce at peak efficiency is closely related to his health and should be safeguarded.

Mechanical devices with electronic memories compute mathematical problems that baffle the human mind. Machines are now made that begin

with raw materials at one end and deliver a finished product at the other end without the touch of a human hand. Miraculous as these achievements are they do not compare with the highest development of organism, the human body. Machines and devices sometime stop functioning and their trouble is generally readily spotted by trained personnel and corrected, but the human body is subject to some 800 types of diseases which can effect the efficiency of its operation. Add the interlocking mysterious workings of the human mind, such as frustration, desire, fear, hope, pleasure and other motivations and the problem of keeping it functioning are staggering.

Preventive medicine is the medicine of the future and far-sighted industry sees the necessity for health-centered, rather than disease-centered medicine. Industry is finding out how to utilize preventive techniques in organic disease to its advantage. Periodic examinations, safety programs, health consciousness and hygiene have enabled the medical director to demonstrate to management that a sound industrial health program is reflected in profit.

Absenteeism not only loses the services of an employee while he is

absent, it very often loses many hours of valuable productivity while he is on the job, because his illness does not allow him to work at his normal efficiency for some time before his illness has been detected and after he has returned to work.

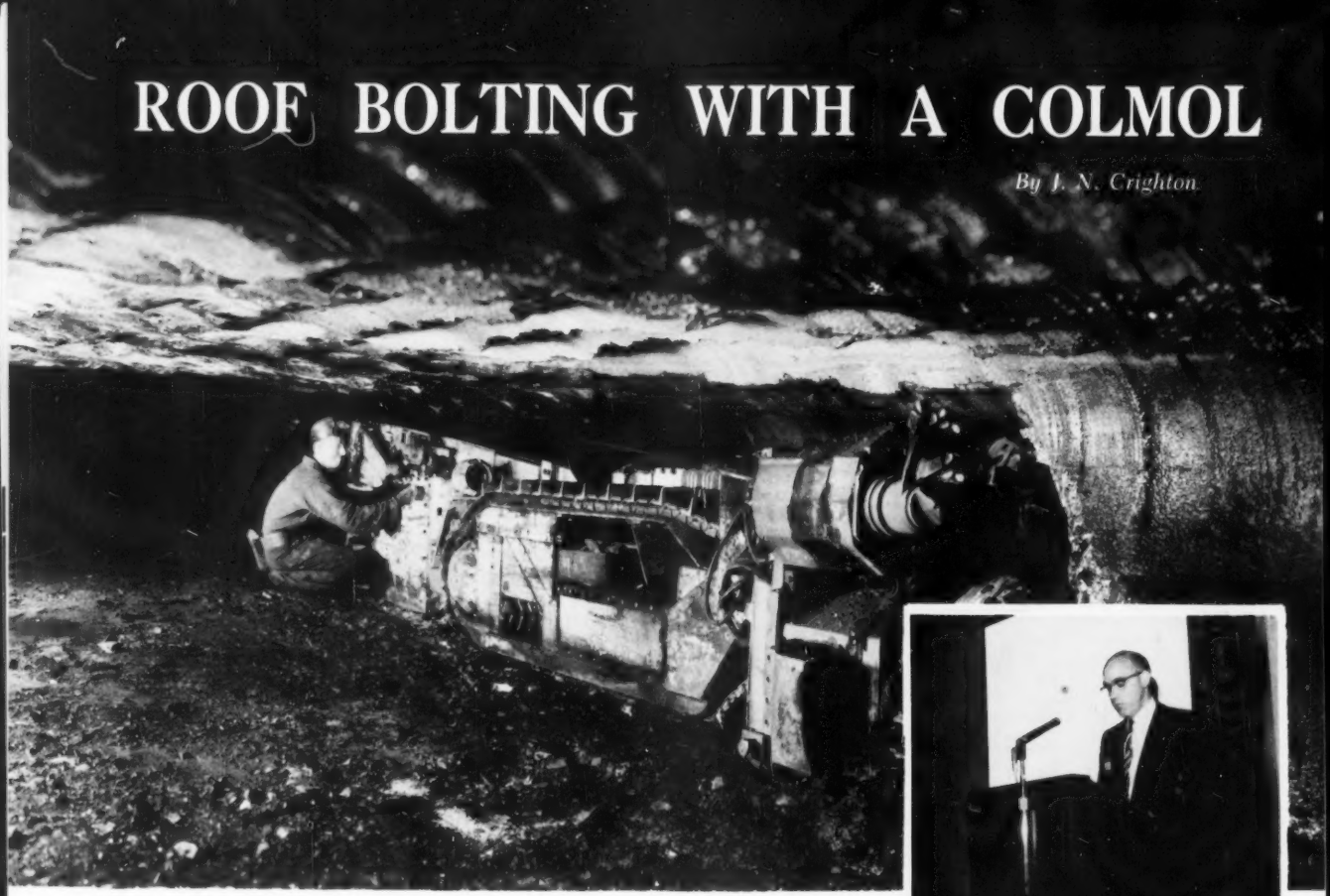
The majority of workers do not place themselves under the care of a medical supervisor but wait until symptoms or disability develop. Many chronic illnesses have no symptoms, so there is a need for pre-employment

physical examination and periodic health inventory of the employee. Physical examinations and health inventories will help reduce poor judgement in the selection of personnel and will alert the worker to the fact that he may be accepting a position for which he is neither physically capable nor emotionally suited.

Small industry, relying on training young workers to reduce labor turnover will find a health maintenance program practical, though a little costlier.

ROOF BOLTING WITH A COLMOL

By J. N. Crighton

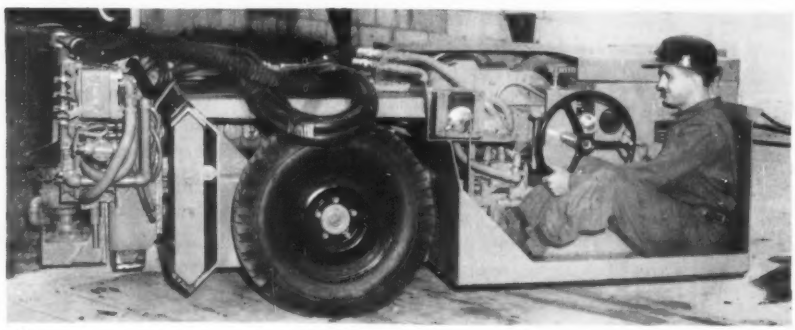


J. N. CRIGHTON

The advent of continuous mining with a Jeffrey Colmol at the Beaver Run Mine of the Johnstown Coal & Coke Company at Beaverdale, Pa., necessitated a means of roof support as nearly continuous and as close to the face as possible. Conventional crossbar or post support would hinder rather than facilitate the planned continuous mining operation because of the relatively great unobstructed face area required for the proposed method of operation. We felt that roof bolting afforded us better support, with an opportunity to establish a definite pattern of mining and development.

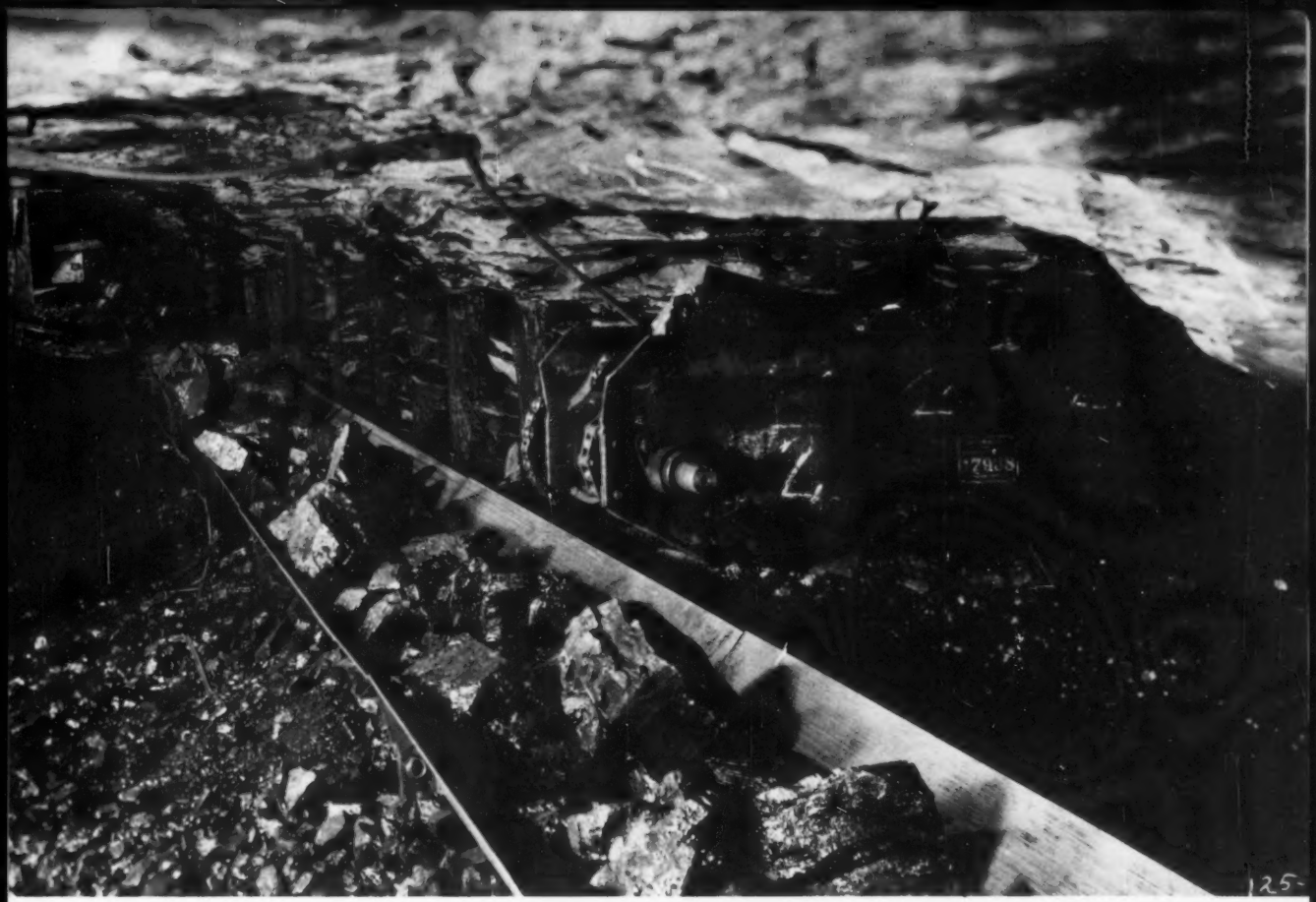
We are using a Model 76-A Jeffrey Colmol followed by a souped up 12-BU Joy Loading Machine and Long PT-158 Piggyback Conveyor loading onto pan lines, providing a nearly continuous flow of coal from the Colmol. The character of the immediate roof being 5 ft. of laminated sandy shale, overlain by sandstone strata from 5 ft. to 26 ft. in thickness, the roof problem was that of maintaining the immediate roof. The laminated structure indicated that bolting would produce the desired results. It became necessary, therefore, to devise a bolting pattern and method of installation to provide maximum support, and at the same time to work hand-in-hand with the continuous mining operation.

Fletcher Roof Drilling Machine



The operational plan is to drive 7 entries 25 ft. wide on 65-ft. centers, with 18-ft. wide breakthroughs on 96-ft. centers. The 25-ft. entry width was accomplished by driving 3 lifts or runs from right to left with the Colmol, the first 9 ft.-6 in. wide, and the second and third 7 ft.-9 in wide. The penetration of the Colmol is limited to 24 ft. beyond the last completed face. Four 25-ft. wide by 24-ft. deep advances develop one entry for one breakthrough distance 96 ft., with 4 chain line additions of 24-ft. units, and a total advance of 384 ft. best utilizes one tandem chain line installation.

After receiving a great deal of assistance from the Roof Control Advisor of the U. S. Bureau of Mines and the



Jeffrey Room And Gathering Conveyors

Roof Fall Investigator of the Pennsylvania Department of Mines, our Engineering and Operating Departments decided upon a bolting pattern, which is as follows:

(1) The last bolt to be a distance from the face no greater than the distance from the operator's controls to the head of the machine.

(2) The two outside rows of bolts to be no greater than 3 ft. from the ribs.

(3) Bolts to be on 4 ft.-9 in. lateral centers, providing 5 rows and 4-ft. centers in line with the place.

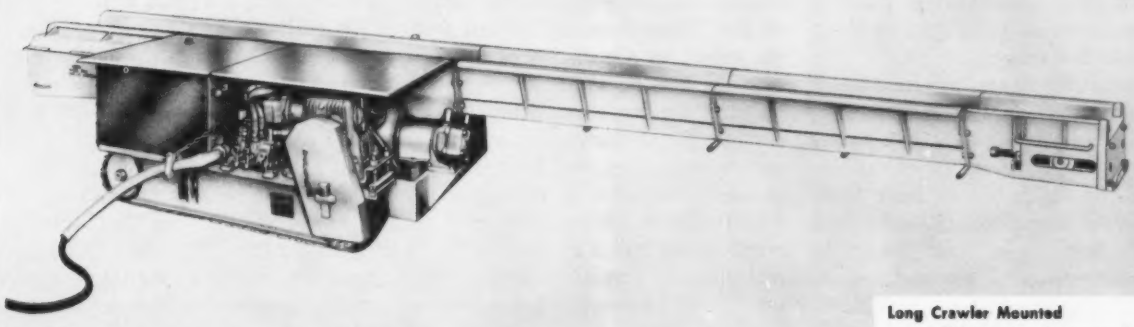
(4) Bolts to be of ¾" diameter 10-20 carbon steel, or ⅝" diameter 10-40 carbon steel, 36 in. and 42 in. long.

(5) Bearing plates to be 6 in. x 6 in. x ¼ in. formed steel.

(6) Roof jacks and/or timbers are to be used for protection during the drilling and bolting cycles.

The roof drilling and bolting machine decided upon to be the most suitable for these requirements was the J. H. Fletcher & Co. Model DAD-7 Roof Control Drill with 8 ft.-6 in. Hydro-Slide attachment, variable speed control on feed and rotation, and with permissible dust-collecting system. This unit is 35 in. high, 64 in. wide, 8 ft.-10 in. long, and permits drilling 4 ft.-3 in. to either side of the

(Continued on Page 24)



Long Crawler Mounted
Self-Tramming Conveyor Drive

RECLAMATION OF STRIPPED LAND IN OHIO AND PENNSYLVANIA

''THE MOUNTAINEER''

To its very tip, THE MOUNTAINEER, at the Hanna Coal Co. in Ohio is the world's largest shovel rising 160 feet into the air (the height of a 16-story building). The machine has a 60 cubic-yard dipper (90 tons), a boom 150 feet long, a dipper handle 92 feet long, a dumping diameter of 290 feet, and a dumping height of 97 feet.

With its lifting power of 500,000 pounds (250 tons) THE MOUNTAINEER has the power to lift a platform containing 166 - 1-½ ton automobiles 100 feet into the air, swing them through the air the length of a football field, set them down on top of a 10 story building, and swing back for another load — and all in 45 seconds.

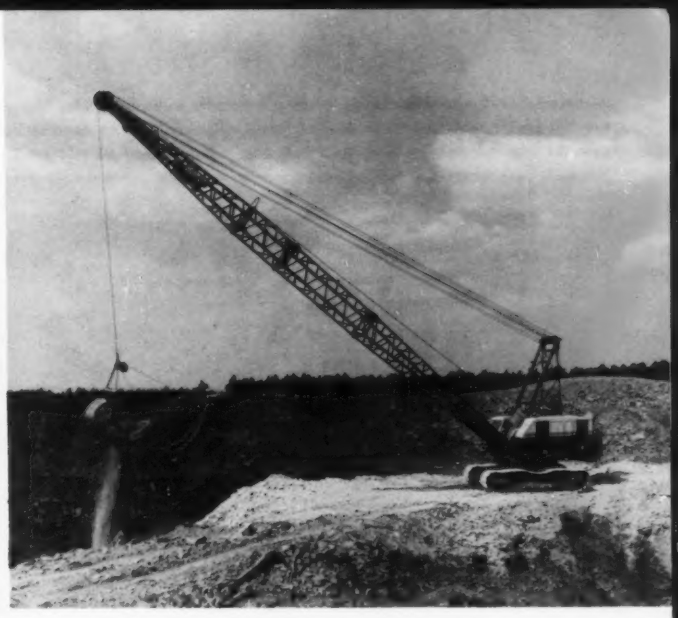
In the coal stripping areas of Ohio and Pennsylvania, new harvests are being reaped from the land. As fast as the big shovels chew the face of mother earth in search of the "black diamond," crawler tractors are building her a new look of green forests, clear lakes, rolling pastures and scenic parks. The nation's biggest producing area of stripped coal has been given a new and more healthy complexion in place of long worn out land and the face lifting continues at a tremendous pace.

At a steadily increasing rate the coal mining companies in Ohio and Pennsylvania are planting trees and grasses as only a part of the many projects developed on the reclaimed areas. Since the end of World War II more than 60,000 acres have been planted in trees and grasses by the members of several strip mining associations alone. The stands of wheat, corn and alfalfa on stripped land in central Pennsylvania and the more than 18 million trees planted by the Ohio Reclamation Association and its members portray the excellent results of planned strip mining.

One of several mining companies, large and small, that can point to reclamation programs carried to the ultimate in putting stripped land to the best end use is Harmon Creek Coal Corporation, Burgettstown, Pa., winner of the "Plant America" award from the American Association of Nurserymen. In August, 1955, Mr. James F. Hillman, the firm's president, thinking back to his company's first attempt at getting more than coal from its land, recalled, "We started to experiment with the spoils left from stripping operations and found it was possible to plant within certain limitations and within the framework of a solid economic foundation." Hillman took over the reins of Harmon Creek in 1934 and after 18 months at the helm decided to do something about the spoils left from operations. Western Pennsylvania is not a farming area and the main source of income in the rural towns is employment at the mines. Mr. Hillman relates, "We decided on recreational areas and found after experimentation that it was quite easy to put in with tractors, facilities such as fishing and hunting areas at a small cost."

Actually the company has gone much further than establishing a mere recreational area. The firm has contoured and planted over 2,000 acres and has found it easier to grow its own trees and bushes in its well established nursery. Mr. Hillman explains the recreational area this way, "We reclaimed 75 to 80 acres to a level field with many fine elms and gave it to the town of Burgettstown. It was set up as a non-profit corporation with local citizens not connected with the mine on

Bucyrus-Erie Model 22-B Loading Out Coal
At The Zacherel Coal Co., Oil City, Pa.



Bucyrus-Erie Model 88-B Dragline Stripping
For Robert Bailey Near Morrisdale, Pa.

the governing board. At the start we were faced with the alternative of keeping this land and selling it, perhaps for eventual use by the community, or giving it to the community where most of our people lived. We chose to give it to them."

Three Cat D8 Tractors and three D7 Tractors do all the reclaiming at the Florence Mine at Burgettstown. Full scale grading of the stripped areas started in 1944 with the reclaiming of 50 acres and the planting of 14,500 trees. Today plantings total approximately two million trees and over 1,055 seeded acres. Much of the work already completed was accomplished under the guidance of Mr. W. R. Allison, Forester, now retired and Mr. Walter Robertson, mine superintendent.

Burgettstown park covers 77 acres that includes picnic tables, outdoor fireplaces, shelter houses, a modern swimming pool, baseball fields, clubhouse, tennis and basketball courts, wooded areas inhabited by quail, pheasants, deer and rabbits and an 8.7 acre lake stocked with fish.

Approaching reclamation with a different program than Harmon Creek but with one that has been equally successful is the Hanna Coal Co., a division of Pittsburgh Consolidation Coal Co.

At the company's Georgetown Mine near Cadiz, Ohio, cattle have become a by-product of coal with the development of a highly successful program for raising white faced Herefords on pastures reclaimed from stripping spoil. Mr. Edwin Mills, superintendent of reclamation, explains the program that has flourished under his guidance, "With the passage of the law in 1949 requiring grading and planting of all affected areas it has been the policy of our company to create, from the major

(*Continued on Page 16*)

Model D-8 Caterpillar Tractor Leveling
Spoil in Pennsylvania Strip Mine Area.

Model D-9 Caterpillar Tractor Back Filling in Ohio Strip Mine Area.

A growth including alfalfa, brome grass and timothy is being cut for forage at Hanna Coal Co. This forage crop taken from leveled lands will be fed to the company's livestock carried over the winter months.

Caterpillar Diesel D8 Tractor equipped with No. built equipment working on coal stripping

(Continued from Page 15)

part of its mined over lands, areas suitable for livestock grazing and forage production."

This beef cattle program was inaugurated in 1951 to make use of the reclaimed company owned pasture lands on which fencing and other facilities had been constructed. Last year about 300 head of Hereford beef cattle were wintered, about 160 head of which were brood cows. These cows produced calves which were carried up to slaughter weight by pasturing on the reclaimed and seeded spoil bank areas and sold. The total company acreage in grass cover is over 3,500 acres of which more than 1,900 acres are fenced for cattle grazing.

Currently Hanna Coal is uncovering about 800 acres of coal each year and reclaiming about 1100 acres per year. For the past several years the company has been reclaiming a greater area than has been uncovered. This additional acreage reflects the practice of grading surface, uncovered many years ago. Approximately 70 per cent of the reclaimed area when graded and disc harrowed is fertilized and seeded to a legume-grass forage cover with the remainder of the area being turned to lakes or tree plantings. Mills talks about the company's success with beef cattle like this, "We have found, in our limited experience, that the spoil bank areas when graded and seeded with the right kind of pasture grasses produce an excellent quality of forage growth. The amount of growth is somewhat more dependent on moisture content and rainfall than it is on undisturbed land, but for some reason, probably due to the high mineral content of the areas, livestock much prefer it to that growing on undisturbed fields. For instance, if an enclosed pasture area should contain both undisturbed land pasture and spoil bank pasture, and both are available, invariably livestock will be found grazing that reclaimed land area."

To keep pace with Hanna's giant stripping shovels 16 Cat D8 Tractors are used almost exclusively in grading the spoil banks thrown up by these shovels. Because of the size of the firm's operation an average of five units two shifts per day is maintained on reclamation work. Reverse slope grading and terracing is employed in backfilling operations. By constructing as many benches as possible in the spoil, grades on the terrace type grading are kept to approximately 1½ to 1.

In the heavily stripped central Pennsylvania area the problem of successfully reclaiming stripped land is a much more formidable one than that facing operators such as Harmon Creek, Hanna Coal and other strippers in eastern Ohio and southwestern Pennsylvania. In Pennsylvania's Clearfield, Centre, Clinton and adjoining counties, the picture is quite a different one and it leaves the coal companies with no small problem in reclaiming the land after they have stripped the coal. Where farm land has been stripped many of the farms are already abandoned, an indication of the failure of the land to provide a living for its tenants. Still a greater percentage of the stripped areas lie in the mountain areas where shale and sandrock overburden never did produce either agricultural or timber crops and that has repeatedly gone through the tax sale process. The shale and sandrock content of the soil in this area dictates the planting of many more trees in proportion to grass acreage than in the more fertile strip mining areas of

lldozer is one of several pieces of Caterpillar-ations south of Uniontown, Pennsylvania.

In the central Pennsylvania coal stripping area the heavy shale and sandrock content of the overburden makes going rough in backfilling operations. Back in the mountains, crawler tractors such as this Caterpillar D8 Tractor owned by DuBois Coal Company, are the only units that can travel the steep slopes and grade the huge spoil banks. The large amount of shale and sandrock in the graded areas makes growth of plantings difficult but large healthy stands of valuable hardwoods still survive on this restored surface.

much of Ohio. At the present time tree plantings account for approximately 65 per cent of the total area reclaimed.

Over 500 acres in this rugged Allegheny country has been reclaimed by the DuBois Coal Co. DuBois reclamation job presents an even tougher problem because of the dragline used for stripping that throws up inverted cone spoils, much more difficult to grade than those left by shovels. Nevertheless, the firm has planted over 370 acres with more than 400,000 seedlings in addition to acreage reclaimed by the landowner at his request.

Typical of the more difficult reclamation job facing operators in this area is the size of sandrock in the overburden. Even after shooting, pieces of sandrock remain that are still too large to fit in the five yard bucket on the firm's 4500 Manitowoc. Due to these conditions plantings are predominantly trees. Valuable species, however, of pine locust and other soft and hard woods, largely bought from state nurseries, are planted where worthless species of Wild Cherry, Juneberry, Devil's Club, Aspen and Pin Oak grew before stripping. At DuBois, as in many operations, tractors used for backfilling are also used on other jobs throughout the mine. A Cat D8 Tractor is occasionally used to strip overburden down to the sandrock when it isn't working with the firm's two D7 Tractors in grading spoil.

Mr. B. M. DuBois, president of the firm, also heads the Central Pennsylvania Open Pit Mining Association, one of several strippers' associations in the state that play a part in the state's reclamation picture by assisting the operators with their programs. G. Albert Stewart, executive secretary of the association describes some of the reclamation work done by its members like this. "In central Pennsylvania, there are stands of wheat, corn and alfalfa on stripped surfaces. True, some of the fields could not do credit to a Minnesota corn field, a Kansas wheat field, or a Lancaster county (Pennsylvania) alfalfa field but they do prove two things; first, that operators are reclaiming stripped land; and second, that such crops will grow on restored surface."

End uses for the graded spoils can vary greatly with the mineral content of the soil, the owner's wishes and the p^H of the soil. (p^H represents the acidity or alkalinity of the soil on a scale from 1 to 14. A low p^H indicates acidity and high p^H indicates an alkaline condition. Most legumes and grasses introduced on graded spoil will survive at a p^H 5.5 to p^H 7.0) The Polen brothers, principals of the Polen Coal Co., Hopedale, Ohio, will put in a private three hole golf course on a 500-acre section of the firm's graded spoils.

In Ohio damming of the last cut as required by law is providing much needed inland water and these new lakes have become popular fishing spots. Two sportsmen's clubs with a combined membership of over 1,000 occupy two lakes at the Betsy Mine of the Powhatan Mining Co. near Bloomfield, in Jefferson County, Ohio.

The Powhatan Mining Co., a pioneer in strip mine reclamation in the state of Ohio, has been stripping at the Betsy Mine since 1934 and first planted spoil bank areas in 1937. Under the guidance of Mr. Charles Breeding, field director of the Ohio Reclamation Association, two experimental orchards were planted on land

(Continued on Page 18)

Caterpillar Diesel D9 Tractor equipped with No. 9S Bulldozer is dozing the spoil bank cast by Bucyrus-Erie shovel on coal mining operation in Ohio.

(Continued from Page 17)

reclaimed at Powhatan in 1952 and have successfully produced peaches and grapes.

Instrumental in much of the successful reclamation projects throughout Ohio, the Ohio Reclamation Association represents approximately 75 per cent of the tonnage in Ohio and almost 50 per cent of the strippers in the state. Operating on a non-proft basis the organization renders planting and mapping services at cost. Before advising a member on reclamation, a study is made of the history of the land, markets in the area, use of the surrounding land and what the land will do. These services support the basic policy of the association expressed by Mr. Larry Cook, executive director as, "producing a long-range reclamation program by putting the land to the best end use." Cook further describes the association's work like this, "Basically we try to build up an economy for the day when the stripper leaves the area."

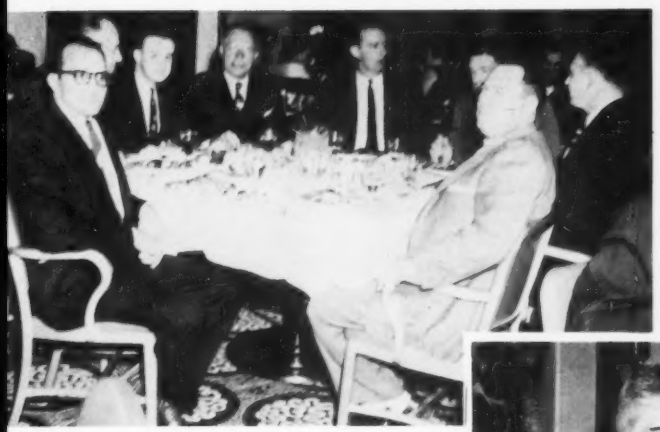
Dr. Charles V. Riley, technical consultant for the ORA, working with the various problems confronting strippers in their reclamation efforts, has found the presence of acidity in the soil or water to be an opposition to successful reclamation. But fortunately only a small percentage of the stripped acreage in Ohio is acid in character, and an even less amount is toxic. The percentage is greater in Pennsylvania due to a difference in overburden in some areas. Where an acid condition exists, it may lead to the planting of trees instead of grasses, although this is true only if the area is low in p^H, as most growth takes place in land that is acidic rather than alkaline in character. When the p^H becomes so low as to become toxic, growth is prevented.

Only about five per cent of the stripped land in Ohio is toxic, and even this condition is not permanent, for on much of it the acid oxidizes out of the material and leaches away in a very short time. It is the practice and the requirement of the Ohio law that the final cut be dammed to permit the impoundment of water. According to Dr. Riley, in many lakes where the acidity from silt shales and sandstone runs high, a p^H of 4 to 4.5 can be brought up to a p^H 6.5 in 5 to 8 years by covering the coal seam with water. The best remedies for an acid condition have proven to be covering the coal seam with three feet of overburden or bringing the water level above the coal in strip mine lakes.

Strippers have reported costs of reclaiming an acre of stripped land that vary greatly in various regions and with the amount of coal being taken out. In some cases operators have been able to perform the work for less than $150 per acre while more difficult conditions have run the cost as high as $200. Planting and seeding costs also vary considerably with conditions, some operators claiming a cost of approximately $20 per acre while in some cases the same operation can be performed for $15 per acre.

Caterpillar D9 Tractor equipped with No. 9A Bulldozer is leveling spoil banks cast up by stripping shovel on coal mining operations, west of Flushing, Ohio. It also is used for stripping coal.

ANNUAL MEETING
Central Appalachian Section, AIME
And
West Virginia Coal Mining Institute



Left: Ben Teano, Kennametal, Inc.; John Rudnicki, and Guy E. Hoover, C & O Railroad; E. M. Pace, E. H. Roberts, G. W. Lockin, Inland Steel Co.; Jack W. Begley, Kennametal, Inc.

Left: R. O. Schoor, Mrs. L. V. Caudill, Ray Cote, L. V. Caudill, Mrs. R. O. Schoor, J. C. Hume, Mrs. Hume, Mrs. Ray Cote, all with the Cardox Corp.

George O. Tarleton, President Consolidation Coal Co., (Kentucky) was chairman of the entertainment committee.

On this earth no progress is final — even rocks in the earth improve with age. Over the ages man has tried to better understand the physical universe and how to apply understanding to the control of power over physical nature. Over the ages man has striven to understand the nature of his mind, his consciousness and the process of his learning. Man has formulated morals, ethics and codes of human behavior and has contemplated the meaning and purpose of his life.

What we learn makes us want to know more about what we think we should know. Every solved problem for human betterment gives us a

(Continued on Page 20)

Left: B. B. Houseman, Secretary, Pocahontas Operators Assn.; W. E. and Mrs. McQuail, General Manager, Crozer Coal Co.; Henry S. Carter, Mine Safety Appliances Co.; Arthur E. Belton, Robinson & Robinson; Charles V. Miller, Mine Safety Appliances Co.

Left: Alan H. McClain and R. H. Edele, Research Engineers, W. Va. University; E. M. Williamson, United Fuel Gas Co.; R. W. Laird, Associate Professor, W. Va. University; Fred O. See, Vice President, Cardox Corp.; Mrs. E. H. Greenwald, Mrs. Fred See and E. H. Greenwald, Boone County Coal Corp.

Julius Olzer, Chief, Department of Mines, W. Va., with Mrs. Olzer.

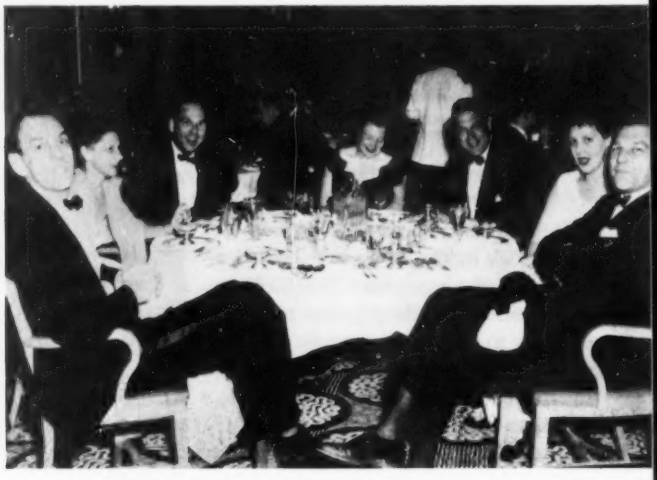
(Continued from Page 19)

broader, deeper outlook for solving the problems confronting us. The limitation of man's mind is farther away than he supposes. In the coal industry we have a great deal of unused ability in every man and it is up to us to find ways of bringing out that unused ability. It is essential that the men in the coal industry understand the nature of the present radical changes that are taking place in production methods and techniques. Technology has greatly enhanced the welfare of the coal mining man and he must strive to make every man contribute his potential share in this great endeavor.

Technical papers presented at the coal division of the combined A.I.M.E. and West Virginia Coal Mining Institute held at the Greenbrier Hotel at White Sulphur Springs, West Virginia, discussed Air Rotary DGG Core Drilling: Some Corrosion Problems in Coal Mining: Fire Resistant Conveyor Belting; Modern Techniques in Mechanical Design Application to Continuous Mining Machines and The Use of the Altimiter in Economic Ventilation.

The Annual Banquet was held in The Mural Dining Room. The Toastmaster at the Banquet was Billy German, retired. The Guest Speaker was Dr. Walter A. Flick, Chairman, Department of Psychology and Education, Washington & Lee University, Lexington, Virginia who spoke on the subject of Gadgets and Judgements. The talk was very interesting and funny.

Left: H. L. Kirkpatrick, New River Co.; L. A. Gates, Ferguson & Gates Engineering Co., Mrs. L. A. Gates, T. W. and Mrs. Howard, Mrs. and Mr. W. A. Haslam, New River Co.; and Mrs. H. L. Kirkpatrick.



Left: W. E. and Mrs. W. E. Afred; Mrs. and Mr. F. C., Jr., Mrs. Alfred and John S. Schroeder, Schroeder Brothers.

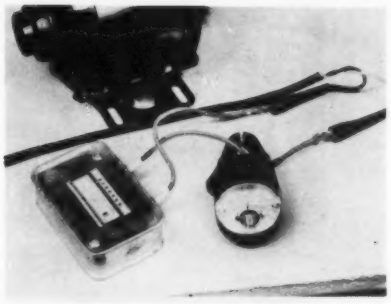
Billy German, retired, entertaining guests at dinner.

Left: Mrs. Lee Siniff, Robert Gerdetz, Cardox Corp.; Leo and Mrs. Bunn, Penn Machine Co.; Mrs. Nicholls, Carl Clayton, Floyd County Coal Co.; E. J. Nicholls, Mrs. Robert Gerdetz, Lee Siniff, J. H. Fletcher & Co.

Spencer Bowman, Research Dept., Cleveland Rock Drill Div., Westinghouse Air Brake Co., presenting his paper "Modern Techniques in Mechanical Design Application To Continuous Mining Techniques."

KEEP THE MACHINERY *ROLLING*

By Lyne S. Metcalfe



Checking Motor Capacitators

The profitable operation of any coal mine has always depended, to some extent, upon the continuous maintenance of sufficient electrical current.

Whenever power failure occurs it brings a long train of work upset and added expense. And, in these days, as the mine becomes more and more mechanized, electrically, power interruptions can reach such major proportions that they may seriously jeopardize the entire operation.

When the electrically driven mechanism of the modern mine comes to a halt, production ceases and fixed costs continue to pile up, and pile up fast. Naturally, idle machinery means idle hands; payrolls continue to mount; general overhead rolls on, unbalanced by normal production; department operations are thrown out of gear; and, in fact, all schedules can become thoroughly disorganized.

The fact is that the modern coal mine, operating as it does on a production basis, must keep the "machinery" rolling on to keep the profits rolling in. This is why every well-managed mine has to take every possible precaution to ensure, in advance, that its power sources — its motors and its power lines, and its equipment are properly functioning.

This safeguarding of power becomes largely a matter of correct, scientific voltage and amperage testing at proper predetermined intervals, and with methods which assure exact readings. After all, the motor is the "heart" of the operation.

Great strides have been made in recent years in the development of special techniques and devices to make these tests easily performed by practically any employee in the course of regular routine operations. These simple ways and means no longer make it necessary for a trained or skilled electrical engineer or technician to do the job.

The simple facts about these new procedures are well defined in the words of Raymond J. Feldman, B. E. E., Chief Engineer, Pyramid Instrument Company, specialists in amperage and voltage testing techniques, who said to this writer:

"All electrical equipment is designed to operate at a specific voltage and current. Usually it will be found that the equipment will work satisfactorily even if the line voltage differs in a matter of ten per cent plus or minus from the actual rating to be found on the name plate.

"One should be forewarned, on the other hand, that in some few cases a ten per cent voltage drop is liable to result disastrously, for shop operation and for maintenance costs, in a breakdown.

"Such may be the case in connection with an induction motor if it is being loaded down to its fullest capacity both on the start and the run. A ten per cent loss in line voltage will result in a twenty per cent loss in the torque.

"The full load current rating on the name plate of the motor is really to be considered as an approximate value, based on the average unit coming off the manufacturer's production line. It should be understood fully, that the actual current for any one unit must not be read as final and that it may vary as much as plus or minus ten per cent of the rated output.

"However, a motor whose continuous load current exceeds the rated value by 20 per cent or more will be found to have its life definitely reduced by the higher operating temperatures which result from this practice. It is very important that the reason for the excessive current be determined.

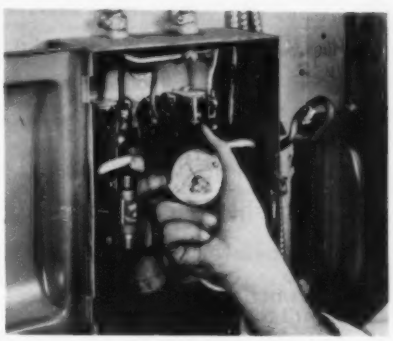
"In many cases this may be found to be simply a case of an overloaded motor. The percentage increase in load will not correspond with percentage increase in load current.

"For example, in the case of a single phase induction motor, a 35% increase in current may correspond to an 80% increase in output torque.

"The operating conditions and the behavior of electrical equipment can, of course, only be correctly analyzed by actual measurement. A comparison of the measured terminal voltage and current should be made with the name plate information. This will give the basic check as to whether the equipment is operating within the stated electrical specifications of the manufacturer.

"The measurement of voltage and current requires the use of two basic instruments. One is the voltmeter — the other an ammeter. In order to correctly measure voltage, the test leads of the voltmeter are placed in contact with the terminals of the line

(Continued on Page 22)



Current Reading

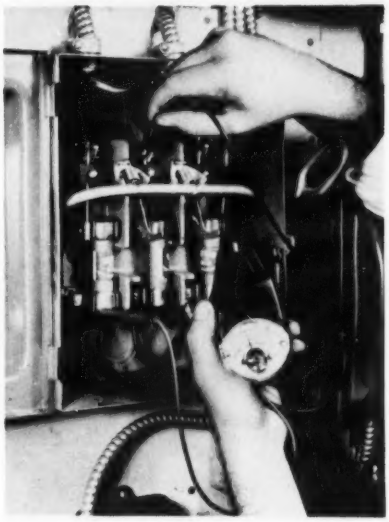
(Continued from Page 21)

which is undergoing test. In connection with the measurement of current, the conventional ammeter must be connected in series with the line, so that the current will flow through the ammeter.

"It has been necessary in the past when inserting the conventional ammeter to completely shut down the equipment. The line had to be broken open, then the ammeter connected, the equipment started again, and then the reading made of the meter. Following this, in the old manner of performing this operation, as much work was involved all over again in removing the ammeter from the line."

As Mr. Feldman pointed out, many of the disadvantages of the older ways of making these tests have tended to be eliminated through the development of the so-called split-core A. C. Volt-Ammeter which is now becoming widely used in the trade.

Also, because of the importance of having the testing device instantly at hand at all times and quickly available to apply, the "snap-around" designed ammeter and volt-meter, combined in one instrument, has become widely used.



Fuse Test

Among the features included in this type of tester are the following advantages:

(a) It is available in a pocket size. It can be carried in a worker's belt, or even in a brief case.

(b) It has insulated probing jaws which reduce the hazards of getting "shorts", as for instance, when working in switch boxes.

(c) It contains a "window" for reading with much higher visibility because it is rimless and the reading scale is flooded with light from all sides at once.

(d) It is dustproof and always in clean working condition.

(e) It can be operated conveniently in, and with one hand, range switches, can be worked with one finger.

(f) It possesses new safety type voltage test leads which protect the user against short circuits and more serious shocks.

The modern plant, with its usual intricate electrical system, now more than ever before, finds increasing needs for careful and continuous electrical testing. Likewise, this involves equally modern methods for doing it.

For instance, it is of great importance to have regular measurements of load current made periodically by wire checking against the fuse or plate ratings.

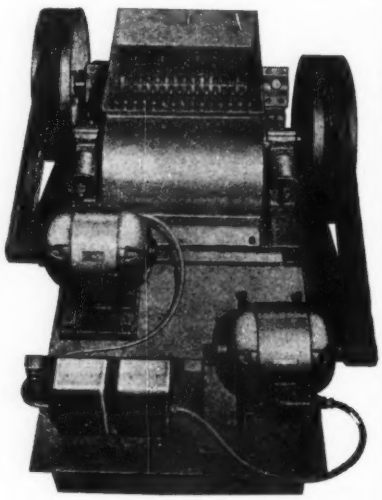
(Continued on Page 29)

SCOTTDALE MACHINE, FOUNDRY & CONSTRUCTION CO.

DEPT. CM BOX 51 SCOTTDALE, PA.

DOUBLE ROLL

COAL CRUSHER



EFFICIENT . . . produces a more uniform product!

ECONOMICAL . . . uses less power!

BOOSTS . . . sales—profits!

NO. 63 SPECIAL — 2 Motor Drive — Produces a Product ¾" to 8". Equipped with Two Grooved Flywheels. (No Gears)

Efficient and practical the shredding action of the crusher's tooth studded double rolls turns out a more consistent product. Quality produced forged steel tooth gears, welded steel base, bronze bushed journal bearings, welded steel hopper and grooved flywheels.

ALWAYS IN THE MARKET

If you have complete mines or parts thereof, loaders, substations, shuttle cars, cutters, motors, rails, or what have you, to SELL, you can be sure that J. T. FISH is ready to BUY. We are always in the market — for any quantity, large or small. We pay fair prices the year 'round regardless of seasonal fluctuations.

WE OWN WHAT WE ADVERTISE

Buy from the largest stock of good mining equipment in America. Includes all types of Joy Cutters, Loaders, Shuttle Cars, Cat Trucks, Belt Conveyors, Chain Conveyors, etc.

JOY EQUIPMENT—Rebuilt

1—Joy 20BU, 24" high, Loader, like new.
1—Joy 14BU, low pedestal Loader, 38-J head motors.
1—Joy 14BU, 7BE Loader, 10 H. P. head motors.
1—Joy 14BU, 7CE Loader, 10 H. P. motors.
1—Joy 14BU, 3PE Loader.
3—Joy 12BU Loaders, 9E, like new.
2—Joy 8BU Loaders.
6—Joy 32E9 Shuttle Cars.
2—Joy 32D Battery Cars.
2—Joy 5SC Shuttle Cars, 250 volt DC.
2—Jeffrey 66-B four wheel drive, latest type, shuttle cars.
1—Joy T-1 Standard Cat Truck.
1—Joy T-2-5 Cat Truck, AC.
2—Joy Ladel MTB 30", 25 and 40 H. P. tandem drive, 2000' Belt Conveyors.
4—Joy 11B Cutting Machines, like new.
1—Joy 7B1 Cutting Machine. Excellent.
8—Goodman Machines on cats, 31" high. All hydraulic.
3—Goodman 512 Cutting Machines.

LOCOMOTIVES

3—Jeffrey 20 ton, type MH-110.
1—Jeffrey 13 ton, type MH-110.
3—Jeffrey 10 ton, MH-78, 42" & 48" Gauge.
4—Jeffrey 8 ton, type MH-100, 42", 44" & 48" Gauge.
12—Jeffrey 6 ton, type MH-88, 42", 44" and 48" Gauge.
3—Jeffrey 4 ton, type MH-96, 42", 44" and 48" Gauge.
3—G. E. 4 ton, type 825 Locomotives, 26" high.
10—G. E. 6 ton, types 801, 803, 821 Locomotives, 42", 44" and 48" Gauge.
1—G. E. 8 ton, type 822 Locomotive, 44" Gauge.
1—G. E. 10 ton, type 809 Locomotives, 42", 44" and 48" Gauge.
8—Goodman type 33, 6 ton, 44" and 48" Gauge.
2—Goodman 8 ton, type 32A, 44" and 48" Gauge.
3—Westinghouse, type 902, 4 ton.
2—Westinghouse, type 904, 6 ton.
2—Westinghouse, type 906.
6—Westinghouse, type 907, 10 ton.
3—Gasoline and Diesel Locomotives, 4 to 10 tons.

TIPPLE EQUIPMENT

1—Jeffrey 24" x 24" Crusher.
2—Jeffrey 30" x 30" Crushers, new.
1—McClanahan 18" x 18" Crusher.
2—Double Roll Crushers.
1—Cedar Rapids portable super Screening Plants.
1—Portable Belt Conveyor 20', gas driven.
1—Railroad Car Unloading Conveyor, gas driven.
1—Allis Chalmers 5' x 14' Rippflo Vibrator.
1—4' x 10' Robbins Gyrex Vibrator.
Feeders, Drag Conveyors and Loading Booms.

CUTTING MACHINES

4—Baby Goodman 212's, rebuilt.
3—Goodman 312's, 18" high.
3—Goodman 412's Cutters, 18" high.
2—Goodman 512's, hydraulic.
15—Goodman 12AA's and 112AA's.
10—Goodman 324 Slabbers.
2—Goodman 224 Slabbers.
2—Goodman 724 Slabbers.
1—Jeffrey 29C on cats.
6—Jeffrey 35L's, like new.
8—Jeffrey 35B's and 35BB's.
2—Jeffrey 29B's on track.
1—Jeffrey 29L, track mounted.
2—Jeffrey 29C's, track mounted.

LOADING MACHINES

9—Joy Loaders, all types.
2—Jeffrey 61 CLR on rubber, 26".
3—Jeffrey L-500 Loaders.
2—Goodman 360 Loaders.
4—Myers Whaley No. 3 Automat Loaders.
4—Clarkson Loaders, 26" above rail.

CONVEYORS

6—Jeffrey 61AM Room Conveyors, 300 ft.
10—Jeffrey 61 HG Face Conveyors.
5—Long Room Conveyors, type 400, 300 ft.
2—61EW Elevating Conveyors.
2—61WH 15" Room Conveyors, 300 ft.
4—Joy 30" Belt Conveyors, 10 to 40 H. P.
4—Joy Ladel UN-17 Shakers.
10—Goodman G-12½ and G-15 Shakers.

CONVERTERS AND DIESEL PLANTS

3—100KW, G. E. TCC-6's, 250 volt, Rotary Converters.
3—150KW, G. E. HCC-6's, 250 volt, Rotary Converters.
1—200KW, G. E. HCC-6 Rotary Converter.
3—300KW, G. E. HCC-6 Rotary Converter.
1—300KW Westinghouse Rotary Converter.
1—500KW Westinghouse Rotary Converter. (all the above with 6900/13,000 and-or 2300/4000 primary transformers).
1—200KW Westinghouse portable Rectifier.
2—150KW MG sets, G. E. and Westinghouse.
1—200KW MG Set, General Electric.
2—300KW MG Set, General Electric.
1—500KW MG Set, General Electric.
1—Cummins 125 KW, 250 volt DC.
1—700 H. P. Shaft Hoise, complete.

Complete steam plant, will sell all or any part. Boilers, like new, 1100 H. P., 500 H. P. Transformers. Turbines, etc. Complete Tipples with Cleaning Plants.

ROCK DUSTERS

1—MSA hi pressure on rubber.
1—MSA hi pressure on skids.
1—MSA low pressure Room Duster.
1—Canton Dustributor low pressure.

MISCELLANEOUS

10—Air Compressors, 1 H. P. to 40 H. P.
1—Portable Self Propelled Compressor on rubber tires, 30" high.
40—Mine Pumps, all types.
Pipe, plastic, steel transite, all sizes 1" to 6".
400 Mine Cars, drop bottom and end dump, all gauges.
150 Mine Cars, 18" high, end dump, 44" Gauge.
300 Mine Cars, end dump, 20" high, 48" Gauge.
15—Brown Fayro HKL and HGD Car Spotters.
1—12 ton Differential Slate Larry.
5—Overhead Bridge Cranes.
1—Kanawha Hillside Dump.
1—16 yd. Dragline Bucket.
5—Low Vein Water Cars.
3—3000 Gal. Tanks, like new.
3—9,000 Gal. Tanks, perfect.
Incline Hoists, 25 to 50 H. P.
Machine Tools for Mine Shops.
1,000 Tons Rails, all sizes.
2,000 ft. 3/c. 5000 colt 2/0 cable.
30 tons Copper Trolley and Feeder.
6—Electric Drills, CP572.
300 Transformers from 1 to 2000 KVA, 110 to 13000 Primary Volts.
400 Electric Motors, 3 to 200 H. P.
Suspension Bridge, 300' long for river crossings.
1—International TD-24 Angledozer.
1—International TD-18 Angledozer.
1—Allis Chalmers HD-7 Angledozer.
Huge stock of mine supplies.

THOUSANDS OF OTHER ITEMS

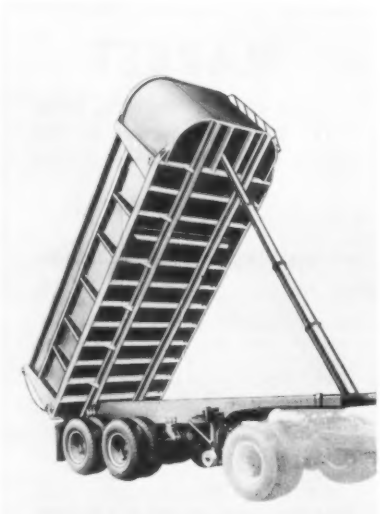
SEND US YOUR INQUIRIES

It Doesn't Cost—It Pays to Buy From

J. T. FISH & COMPANY

Logan, W. Va. **Phone 2825**

YOUR NEW EQUIPMENT DEPARTMENT



Hercules tandem axle trailer dump with single front-mounted 8 inch telescopic hoist.

A new series of single and tandem axle trailer dumps and 4 wheel trailers, with payload capacities of up to 30 cubic yards, is announced by Hercules Steel Products Company, Galion, Ohio.

Equipped with front-mounted single cylinder telescopic hoists, the new units are designed for over-the-road hauling of aggregates and other bulk materials, the manufacturer states. Suitable for use with either single or tandem axle tractors, these new trailer dumps are claimed to be ideal for operation in areas where weight laws establish medium to high gross weight limits and allow credit for one or more sets of tandem axles.

Front mounting of the hoist shifts hoist weight forward onto the tractor axles and substantially improves tractor-trailer load distribution, it is said.

Lifting capacities of up to 35 tons are provided by a single 5 sleeve, 8 inch telescopic hoist, front mounted on 17 to 24 ft. single and tandem axle trailer dumps. Similar capacities are afforded by a 4 sleeve, 7 inch front telescopic hoist offered on 17 ft. single axle trailer dumps and full trailers.

These durable, yet light weight trailer units are constructed for maximum useful service life. High strength alloy steel is used throughout the body. Understructure is made up of 4 inch channel crossmembers gusseted and welded to 6 inch I-beam longitudinals.

Standard equipment includes 7 inch air brakes, 10:00 x 20 tires, landing gear, ICC lights, directional signals and mud flaps.

WHY
guess about
wire rope
selection?
GET
the right
wire rope
for each job!
You get better service when you order the right rope from
the thousand and one wire ropes
made by MACWHYTE
Northeastern and Zanesville Supply Companies are also headquarters for The Jeffrey Mfg., Manufacturers of Chains, Sprockets, Conveyors, Crushers, and Vibrating Equipment.
Stocks of Diamond Roller Chains, Sprockets and Flexible Couplings, Conveyor Belting and all sizes and types of friction material are available from stock.
NORTHEASTERN SUPPLY CO.
321 Cherry Ave., N. E. Canton, Ohio GL. 6-7333
Branch:
ZANESVILLE SUPPLY CO.
75 Maysville Pike Zanesville, Ohio GL. 2-7601
(Also Headquarters for MacWhyte and Diamond Chain Co.)
MACWHYTE COMPANY
KENOSHA, WIS.

ROOF BOLTING WITH A COLMOL

(Continued from Page 13)

center position of the head without moving the machine. Holes are drilled with a 1-7/16 in. tungsten-carbide solid insert bit, 36 in. and 42 in. augers, and an extension, which extension is also used for tightening the bolts.

The face operation of mining and bolting begins with the Colmol making a 9 ft.-6 in. wide box cut or pilot lift on the right side of the entry. Upon completion of this cut, the Colmol is retracted and positioned for the second cut of 7 ft.-9 in. width. The roof drill is trammed to the face of the box cut 24 ft. ahead of the Colmol on the Colmol operator's side. One row of 16-ton Simplex roof support jacks are set on 5-ft. centers from the rear of the bolting machine to the outby edge of the box cut. The machine bolts the roof of this cut with two rows of bolts on the aforementioned centers as the Colmol is mining the second lift. In effect the roof ahead of the Colmol is being bolted, the Colmol is mining forward or inby, while the bolter is bolting outby; therefore, these two machines are

(Continued on Page 25)

ROOF BOLTING WITH A COLMOL

only adjacent to one another for a very short period of time. The bolting rate coincides favorably with the rate of penetration so that a minimum of exposed roof area is unbolted at any given time.

The second cut having been mined and the first having been bolted, the Colmol is positioned for the third lift, and the roof support drill is trammed to the face of the second lift to resume bolting. At the completion of these lifts, the Colmol is in position to advance an additional 24 ft. with the addition of one 24-ft. section of chain line. However, another advance on the left side of the place would expose a 48-ft. length of unbolted roof, and the drill would be idle for that lift; therefore, it is necessary to tram the Colmol to the right side of the place and position it there for the next box cut so that the last mined cut can be bolted. We now have a short movie which was produced by J. H. Sherrard, our Chief Engineer, in conjunction with his wife, Betsy, who handled the lighting. This was not done underground, but was reproduced on their dining room table. I am sure it will explain our system to you better than I have just tried to do.

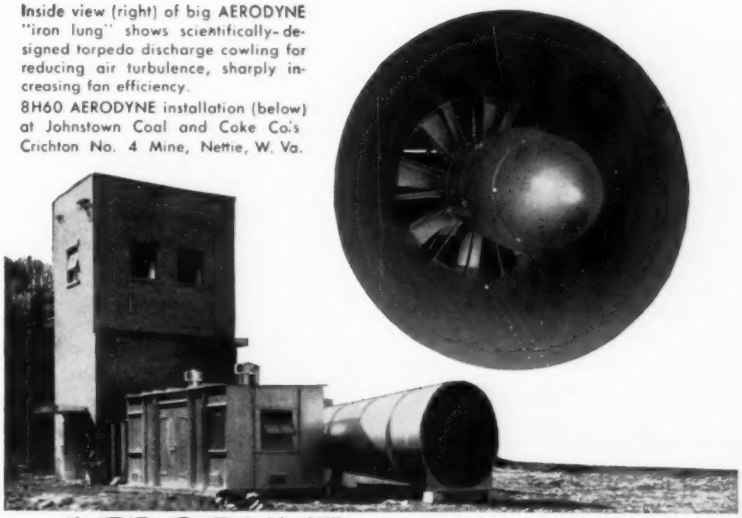
Conditions adversely affecting the mining and bolting operations are encountered in portions of the Lower Freeport seam in this area. One is a natural condition, the other man-made. A double seam is encountered at times, with a stratum of extremely hard sandstone between the two seams. The Lower Freeport seam remains a normal 48 in. to 54 in. thickness. It is overlain by a hard sandstone from 1 in. to several feet in thickness, which in turn is overlain by a mother seam of coal varying in thickness from streaks to 3 ft. Where the sandstone and mother coal combined are greater than 42 in. thick, with the sandstone less than 3 ft. thick, an anchor for the expansion shell cannot be made for it would be located in the coal. Where the sandstone is greater than 3 ft. thick, it is self-supporting over the span of one machine width. It is supported in the immediate face area by roof jacks, and in the area behind that required for equipment movement by 5 in. x 7 in. x 14 ft. crossbars and/or 6 in. diameter posts. This means of roof support reduces the effectiveness of continuous mining, and fortunately the areas thus affected are relatively small.

The second adverse condition met is that caused by the Lower Kittanning seam having been partially retreated 160 ft. below the operational area of the Colmol in the Lower Freeport seam. The outline of the retreated area is irregular, and in passing from the pillared to the first mining area and back, the roof and floor are in an apparent dynamic condition, although there is no visible break in either.

The roof begins to break shortly after having been exposed for a distance of approximately 50 ft. on either

(Continued on Page 26)

Inside view (right) of big AERODYNE "iron lung" shows scientifically-designed torpedo discharge cowling for reducing air turbulence, sharply increasing fan efficiency.
8H60 AERODYNE installation (below) at Johnstown Coal and Coke Co.'s Crichton No. 4 Mine, Nettie, W. Va.



AERODYNE **power for deep breathing underground**

Coal mines can take deep breaths with the Jeffrey 8H Series AERODYNE Fan. From 20,000 to 500,000 C.F.M. of air can be blown or exhausted at pressure up to 20" W.G.

Individually adjustable blades enable the 8H to operate over a large range of capacities at peak efficiency. Fan can be readjusted as mine characteristics change or easily disassembled for transportation to another location.

Hundreds of AERODYNES have been installed since the fan was introduced in 1936. It is easily the most popular mine fan in America, because it is both flexible and reliable.

6F Series AERODYNE—a six-blade fan combining economy and efficiency for light or medium-duty ventilation up to 5" W.G.

12A Series AERODYNE—a 12-blade, self-contained deluxe fan for heavy duty . . . designed for maximum pressure of 13" W.G. and volumes from 20,000 to 700,000 C.F.M.

AERODYNE Jr.—a low-cost fan for general or auxiliary mine ventilation or industrial applications . . . 5,000 to 150,000 C.F.M. up to 4" W.G.

AERODYNE Midget Blowers, Type 61 Blowers and Universal Blowers for secondary fan duty.

Write for Jeffrey Mine Fan Catalog 901

THE JEFFREY MANUFACTURING COMPANY
Columbus 16, Ohio

JEFFREY

MINING • CONVEYING • PROCESSING EQUIPMENT • TRANSMISSION MACHINERY • CONTRACT MANUFACTURING

KEEP THE MACHINERY ROLLING

(Continued from Page 22)

It is also necessary to test for "shorts" because these often will show why fuses are being blown.

Then, there is the matter of making frequent tests of electrolytic capacitators or condensers, for measuring line voltage and for testing for "opens", as well as for testing motors for "grounds", and, of course, fuses must be checked.

There have been many times in the past — and still are today in some instances — when the trade has been plagued almost every day with some power failures and sundry other "electrical troubles" of various kinds.

The very advantages that electrical power granted to modern industry also brought along with it the requirement that it be understood in order to be properly controlled and harnessed to improve production. This, in turn, gave rise to the necessity of becoming intimately familiar with the agencies represented in electrical equipment and devices needed to correctly utilize such power.

Today, we find that most electrical headaches in **modern** plants are growing less and less prevalent. The many advances and improvements made in the design and construction of testing devices in the fields of amperage and voltage have solved a large part of the basic problems which formerly used to baffle plant operators, and even some of the technicians.

In some few of the plants who have not adopted the modern methods available for periodical testing — and, almost always in the past, the one primary reason for the annoying and upsetting frequency of electrical troubles has been a tendency of both management and electrical workers, and machinery operators, to let threats of trouble in the power situation be handled on a "guessing basis", instead of going right to the trouble itself to make absolutely sure of getting the facts.

The responsibility of management, on self interest alone, has come to be represented in an insistence on actual answers to power failures.

The way to get the answers, as stated previously in discussing the best ways and means of conducting tests, has been found, in most cases, to be the adoption of the dual ammeter and volt-meter for immediate checking of electrical troubles not only at the moment when the first "rumblings" appear, but at stated times in advance of their possible development.

There is one distinct advantage of the dual pocket meters which are coming into very wide use in many workshops which depend on current for production operations. Plant reports of their use indicate their value is in being always at hand in the pocket, ready to "snap-around" to make an instant test of voltage-amperage conditions. The practice of habitually having them carried by the operating maintenance man is in itself a reminder for him to test before trouble has a chance to start.

The very fact that these new testing devices are so easy to use, and so trouble-free themselves in application, has proven in practice that more and more tests are likely to be made by the responsible employee, with less and less supervision and follow-up by management.

The end result of all this consideration of what is oftentimes neglected as a passing electrical headache, before it reaches actual proportions of power failure, is the controlled reduction of losses from idle machinery and idle workers — and possible serious breakdowns of equipment and even injury to workers because of the previous lack of improper and unreliable inspections.

ROOF BOLTING WITH A COLMOL

(Continued from Page 25)

side of the barrier limits. Bolting is not altogether successful under these conditions, but some success has been had in using overlapping 6 in. channels 8 ft. long, and by the use of crossbars. Additional support is given by conventional timbering with posts and crossbars. When crossbars are used in the face area, they are drilled in place with a steel bit to prevent smoking and possible ignition of the bar. The rest of the process is the standard bolting cycle, and 42 in. bolts are used. Additional drill head positioning time is required with the use of crossbars, but this does not excessively retard the cycle.

Bolting times vary with the means of support required. With crossbars the data is as follows: Average bolting time, 2 minutes, 11 seconds per hole; average cycle time, including moving and positioning, 3 minutes per hole. Optimum bolting time, 1 minute, 21 seconds per hole; optimum cycle time, including moving and positioning, 1 minute, 32 seconds per hole.

Without crossbars the data is as follows: Average volting time, 1 minute, 54 seconds per hole; average cycle time, including moving and positioning, 2 minutes, 11 seconds per hole. Optimum bolting time, 1 minute, 9 seconds per hole; optimum cycle time, including moving and positioning, 1 minute, 17 seconds per hole.

The computed bolting and cycle times are those determined by comparing the shortest time increments from the various studies, and these bolting and cycle times are felt to be quite practical with standard roof and seam conditions. All of the above data was collected with two men working with the machine. The maximum number of bolts installed per face shift of 6 hours is 90 to 100 bolts by 2 men. The operational plan provides for 3.3 tons of coal per bolt, 2 ft.-5 in. advance per bolt. The bolting portion of the cycle is the retarding factor when maximum mining is effected. Because of this it is necessary at times to omit one or more bolts of the second row from the right rib, reset temporary roof jacks, and install those in conjunction with the third and fourth rows, utilizing the 9 ft.-6 in. Hydro-Slide to set 3 bolts with one machine move. However, the rate of penetration of the Colmol cannot be directly related to the footage per bolt or the time per

(Continued on Page 27)

ROOF BOLTING WITH A COLMOL

bolt because of the variables of positioning, tramming, and servicing of the two machines. The Colmol penetration is not as limited as a cursory examination of the foregoing data would indicate.

When the face cycle is retarded by the belting cycle, bolting in the crosscuts may be delayed until the end of the shifts so that the machine may concentrate on and maintain the face bolting pace. As you can see from the foregoing statement, we really could use a rig that would install more than 100 bolts per shift. We are told Fletcher is coming out with a double drill machine in which the operator sits in the middle of the front of the machine where he is able to operate both drill heads from his tramming position. The mast of these drills are to be the rigid type which are raised to the roof to form a solid post before the operation starts, thus making the drilling operation semi-automatic.

We do not contend that we have arrived at the most practical and efficient method of roof support by bolting in conjunction with the Colmol, but we do feel that the equipment used at the present time in this operation and the method of utilizing it has aided greatly in providing a more nearly continuous flow of coal from the face, while providing safety of roof support in the area from which the coal is being mined. Ideal fulfillment of the statement "Roof support by bolting in conjunction with continuous mining" will not be attained until equipment is designed and proven which will drill and bolt roof immediately upon exposure. Practically this would be a point somewhere between the head of the mining machine and the location of the operator, both on semi-stationary and continuous moving miners, the operation to be completely automatic and governed by amount of advance. Until that development is a fact, the industry will work toward auxiliary equipment containing faster single and multiple units to reduce the time between exposure and support.

SHOVELS - DRAGLINES - DRILLS
TRACTORS - TRUCKS

170-B Bucyrus-Erie Electric 6-½ yd. shovel.
1600 P & H 6 yd. electric shovel.
2400 Lima 6 yd. diesel shovel.
2400 Lima 4 yd. Hi-Lift shovel.
120-B Bucyrus-Erie electric 5 yd. shovel.
1400 P & H 4 yd. electric shovel.
111-M Marion 3-½ yd. diesel shovel.
4161 Marion 5 yd. electric shovel. Worked about three years.
1201 Lima 3-½ yd. Diesel Shovel.
955 P & H 2-½ yd. Diesel Shovel.
1201 Lima Hi-Lift Diesel Shovel 42' boom, 32' stick, 2-½ yd. dipper.
1201 Lima Semi-Hi-Lift Diesel Shovel, 36' boom, 27' stick, 2 yd. dipper.
3500 Manitowoc Hi-Lift diesel shovel, 45' boom, 35' stick, 2 yd. dipper.
111-M Marion Hi-Lift diesel shovel, 43' boom, 23' stick, 3 yd. dipper.
40-A Marion Hi-Lift diesel shovel, 45' boom, 34' stick, 2-½ yd. dipper.
9W B-E Electric Dragline 200' boom, 8 yd.
7400 Marion Electric Dragline 200' boom, 8 yd.
625 Page diesel dragline 150' boom, 9 yd. bucket.
5-W Bucyrus-Erie diesel dragline 125' boom, 5 yd. bucket.
2400 Lima diesel dragline 130' boom, 5 yd. bucket.
4500 Manitowoc diesel dragline 120' boom, 5 yd. bucket.
B-E 1208 Electric dragline 110' boom, 4 yd. bucket.
4161 Marion dragline 110' boom, 5 yd. bucket.
111-M Marion diesel dragline 80' boom, 4 yd. bucket.
1055 P & H diesel dragline 80' boom, 4 yd. bucket.
1201 Lima diesel dragline 85' boom, 3 yd. bucket. Independent boom hoist.
3500 Manitowoc diesel dragline 85' boom, 2-½ yd. bucket.
600 Reich Heavy truck mounted rotary drill.
Quarrymaster Drill with 2 - 500 cu. ft. compressors.
58-BH Joy Champion Rotary Air Drill
56-BH Joy Middleweight Rotary Air Drill

Also 42-T, 29-T, and 27-T Well Drills
Euclid Trucks — Many to Choose From

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l Bank Bldg. Hazleton, Pa. GLadstone 5-3658

NOW at
BECKWITH
MACHINERY COMPANY
CERTIFIED BUY

USED EQUIPMENT

Item 1255-C255—Caterpillar D8 Tractor. Machine in good operating condition. Mounted with LaPlant-Choate Hydraulic Blade and Control. Equipped with crankcase guard, pull hook and canopy top. F. O. B. Clearfield, Pa. **$4000.00**

Item 1055-P377—Caterpillar D7 Tractor mounted with LaPlant-Choate Hydraulic Angle Blade. Gasoline starting engine serviced; diesel engine serviced and valves adjusted; master clutch repaired and new clutch brake installed; steering clutches and brakes reconditioned; steering and master clutch linkage rebushed; new pinions, flanges, hubs, seals, bearings, bellows, seals and new dead shaft installed in the final drives; track, rollers, sprockets and idlers in good condition. F.O.B. Pittsburgh, Pa.
CERTIFIED BUY **$7500.00**

Item 455-B146—Caterpillar D6 Tractor equipped with LaPlant - Choate Angling Bulldozer. Rebuilt engine including new crankshaft and bearing; repaired left final drive, flywheel clutch, clutch linkage, track roller frame on right side. New hydraulic hoses, end bits and C-frame; tracks were pinned and bushed recently. F.O.B., Bradford, Pa.
CERTIFIED BUY **$6600.00**

Item 955-WV159—Caterpillar D7 Tractor mounted with LaPlant-Choate Angledozer and LeTorneau D. D. Cable Control. This unit was just returned from a one month rental. Prior to rental, we installed new master clutch brake, rebushed steering control lever and relined cable control cone. Unit is in good running condition. F.O.B. Clarksburg, West Va.
BUY AND TRY **$5000.00**

Item 655-P345—Caterpillar D7 Tractor, mounted with Rear Double Drum Cable Control and LeTorneau Angle Blade. This machine has good tracks, bottom rollers, sprockets, and idlers; new master clutch; machine is in good condition. F.O.B. Pittsburgh, Pa. **$3500.00**

Item 955-P366—Caterpillar D4-HT4 Hydraulic Hylift. Reconditioned starting engine. Rebuilt diesel engine cylinder head. Installed new ring and bushings and seals in hydraulic pump; rebushed lift and tilt arms at bucket. Installed new cutting edge on bucket. Installed new bottom rollers, new sprockets, new idlers and bellows seals. F.O.B. Pittsburgh, Pa.
CERTIFIED BUY **$6800.00**

BECKWITH
MACHINERY COMPANY
6550 Hamilton Avenue, Pittsburgh, Pa.
361-369 Congress St., Bradford, Pa.
Old Town Road, Clearfield, Pa.
1356 E. 12th Street, Erie, Pa.
E. Broadway, Farrell, Pa.
Buckhannon Pike, W. Va. Route 20 (So.), Clarksburg, West Va.

Advertiser's Index
COAL MINING
February, 1956

Allis-Chalmers	8
Beckwith Machinery Co.	3-4-5-6-27-28
Bucyrus-Erie Company	Inside Front Cover
Fish Company, J. T.	23
Highway Equipment Co.	Front And Back Cover
Jeffrey Mfg. Co.	25
Kennametal Inc.	2
Licking View Tool Co., The	10
Lusk, Harold C., Co.	10
Luxner, Albert	28
Manitowoc	7
Mine Safety Appliances Co.	Inside Back Cover
Moore-Flesher Hauling Co.	10
Northeastern Supply Co.	24
Ohio Machinery Co.	3-4-5-6
Salem Tool Co.	1-10
Scottdale Machine & Foundry Construction Co.	22
Simpson, T. L., Machinery Agent	28
Frank Swabb Equipment Co.	27-28
Walker Machinery Co.	3-4-5-6

– FOR SALE –

1—Marion 111-M Shovel, High Front, 3¾ yard.
1—Marion 392 Shovel, High Front, Dragline, 2½ yard.
1—Marion 362 Shovel, High Front, Dragline 1½ yard.

ALBERT LUXNER
Carmichaels, Pennsylvania
Phone: Carmichaels 3751

Jeffrey Coal Mole and Mole Car Conveyor.
2—Carpenter Cen. Dryers, 50 TPH, ½" x 0".
25—Drop Bottom Mine Cars, 5 ton, 40" or 42" ga.
1—55C Joy Shuttle Car, 500 volt.
1—55C Joy Shuttle Car, 250 volts.
1—Goodman 5-Ton Loco. Cable Reel, 42" ga.
2—10-Ton West Loco. and 2—10 Ton G.E., 42" ga.
2—Joy 8BU Loaders and 1—11BU Joy Loader.
2—Jeffrey 29U Cutters and **2—Jeffrey L600,** Bargain.
Jeffrey 5-Ton Battery, locomotive, good.
Joy JCM3 Continuous Miner, 200 Series.
Vibrating Screens, 2 Deck, 4' x 14' and 4' x 10'.
Lorain 820 Shovel, 2 yd., 1950 model.
Austin Grader, new, large Fairfield hydraulic conveyor.
New Steel Ties, 42" ga., 40-lb. rail—Mine Hoists and Drills.
Marion 34-yd. Shovel, available now.

T. L. SIMPSON
MACHINERY AGENT
1200 WOODBOURNE AVE.
PITTSBURGH 26, PA. LEhigh 1-2254

LARGE DRAGLINE BARGAIN

625 Page Two-Engine Walker, 160' boom; 9½ yd. all manganese bucket. Three years old. Right Price. We originally sold this machine, are well acquainted with it, and know it is in excellent condition. Pennsylvania location.

Write — Wire or Phone

FRANK SWABB EQUIPMENT CO., Inc.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa. GLadstone 5-3658

Long Life Facts!

DAMASCUS STEEL 900 A.D.'s BEST

THE TIDE OF MANY A BATTLE WAS TURNED BY FAMED DAMASCUS STEEL. RAZOR-SHARP, SPECIALLY HARDENED, DAMASCUS BLADE HELD ITS EDGE WHILE ORDINARY BLADES BECAME DULL OR BENT.

TRACK BOLT STEEL
BETTER THAN DAMASCUS

THE FINEST DAMASCUS STEEL WAS FAR INFERIOR TO CATERPILLAR'S TRACK BOLT STEEL! BOLTS ARE MADE OF SELECT, HEAT TREATED CARBON STEEL, CAREFULLY DESIGNED AND MACHINED FOR LONG LIFE.

TOUGH, HARD TRACK PINS RESIST WEAR

CAT TRACK PINS ARE "HI-ELECTRO" HARDENED TO PRODUCE A SUPER-HARD SURFACE TO RESIST WEAR, A TOUGH CORE TO RESIST SHOCK AND SHEARING STRESSES.

REMEMBER ONLY YOUR CATERPILLAR DEALER OFFERS YOU GENUINE LONG LIFE CATERPILLAR PARTS

BECKWITH
MACHINERY COMPANY

6550 HAMILTON AVENUE, PITTSBURGH, PA.

OLD TOWN RD. CLEARFIELD, PA. | E. BROADWAY FARRELL, PA. | 1356 E. 12TH ST. ERIE, PA. | 361-369 CONGRESS ST. BRADFORD, PA.

BUCKHANNON PIKE, W. VA., ROUTE 20, (SO.) CLARKSBURG, WEST VIRGINIA

edison self-service

FOR

FAST, ECONOMICAL LAMPROOM OPERATION

The miner serves himself! In seconds he has his lamp off the rack, on his belt, and is ready for his shift. And the same holds true when the shift is over. Add it up . . . Edison Self-Service pays off in maximum lamproom economy.

We will be happy to show you how Edison Self-Service can bring economy and efficiency to your lamproom. Write or call for details.

Edison Double Filament Bulb means continued, full light

See that double filament in the bulb? It's your proved protection against lost time for the miner, and a short crew for the foreman. If one filament burns out, a turn of the switch restores continued, brilliant, full illumination—*working light*, not just emergency light!

MSA
SAFETY EQUIPMENT HEADQUARTERS

When you have a safety problem, M.S.A. is at your service . . . our job is to help you!

MINE SAFETY APPLIANCES COMPANY
201 North Braddock Avenue, Pittsburgh 8, Pa.
At Your Service: 77 Branch Offices in the United States and Mexico

MINE SAFETY APPLIANCES CO. OF CANADA, LTD.
Toronto, Montreal, Calgary, Edmonton, Winnipeg, Vancouver, Sydney, N.S.

Highway...

the dependable source for all mining equipment!

Allis-Chalmers HD-16

Lima dragline . . . C. V. Fink & Son, Pottersdale

Michigan Tractor Shovel . . .
Adamsburg Coal Co., Adamsburg

ALLIS-CHALMERS • GENERAL MOTORS DIESEL ENGINES
LIMA SHOVELS, CRANES, DRAGLINES • BAKER • THOR
POWER-PACK CONVEYORS • GAR WOOD • ERIE BINS
MICHIGAN TRACTOR SHOVELS AND EXCAVATOR-CRANES
MASTER • INTERNATIONAL VIBRO-TAMPERS • JAEGER

Highway

EQUIPMENT COMPANY

6465 Hamilton Ave. • Pittsburgh 6, Pa.